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MEDICAL



JOURNAL

OF AUSTRALIA

VOL. II.—30TH YEAR.

SYDNEY, SATURDAY, AUGUST 14, 1943.

No. 7.

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OXYGEN LACK AND CARBON MONOXIDE.¹

By D. H. LEMESSURIER, B.Sc., M.B., Ch.B.,
Flight-Lieutenant, Officer-in-Charge of a Clinical
Investigation Section, Royal Australian Air
Force.

WITH the ever-increasing race for height in the present air struggle, the dangers of oxygen lack have come into the spotlight. The symptoms of anoxia are my subject in the opening paper of this symposium.

Oxygen Lack. The Brain.

The brain is affected before any other tissue, and will be dealt with first. Psychologically, defective judgement, spurious self-confidence, lack of self-criticism, inaccuracy and lack of appreciation of time are the earliest and actually the most dangerous symptoms. Sometimes pugnacity, hilarity or sleepiness similar to the effects of alcohol are experienced, and also similarly, they are not at all unpleasant. The powers of reasoning are depressed, alertness is dimmed—in fact all mental processes are slowed down. (Simple arithmetical problems become insuperable to the navigator, or a result is obtained which he is sure is correct, but which is actually grossly inaccurate.) Later, unconsciousness supervenes, without the sufferer's being aware of anything abnormal or untoward. Some dizziness is a frequent subjective symptom.

These mental changes, at least in the earlier stages (during which deficiencies, especially under Service conditions, may rapidly bring catastrophe), are not appreciated by the subject himself, but are obvious to an observer with full oxygen supply. It is therefore essential for maximum efficiency to go by the altimeter and not by the symptoms.

¹Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

Vision.

By day, little or no objective visual symptoms appear until an advanced stage, at which dimming of the lights and slight loss of activity are subjectively experienced. By night adequate oxygen is of even greater importance, as even the slight degree of oxygen lack at 10,000 feet considerably impairs the ability of the subject to "dark adapt" himself to weak lights and to discern dimly illuminated objects.

Hearing.

The hearing is only slightly affected; but this may be enough to spoil the appreciation of small changes in engine rate, so important in the synchronizing of multi-engined aircraft.

Muscles and Nerves.

The arms and legs feel weak. The gait is unsteady, and with more severe oxygen lack the coordination of movements is impossible; writing becomes difficult, and the speech slow and thick. Finally, uncontrollable tremors and twitching of the arms passing into unconsciousness occur. "Passing out" is such an imperceptible process that the subject on recovering consciousness may be completely unaware of it. This happens to pilots flying solo, who find themselves in an unexplained spin or steep dive, if they "come to" in time.

Cold.

Lack of oxygen, by reducing metabolism and by upsetting the central vasomotor control, results in rapid chilling of the body. It must be emphasized that extra oxygen will not prevent chilling if the subject is inadequately dressed.

Air Sickness.

Lack of oxygen predisposes the subject to air sickness; further, those suffering from air sickness may benefit if given extra oxygen, even though they are flying at levels at which oxygen is not usually necessary.

Other Effects.

In the later stages, respiration becomes almost of the Cheyne-Stokes type, alternately quicker and slower; but this is often not appreciated by the sufferer, though it is obvious to an observer. A rapid pulse rate is a feature at this stage. Prolonged exposure to slight degrees of oxygen lack, too slight to produce immediate effects, will in time impair efficiency and lead to unnecessary discomfort and fatigue.¹

Carbon Monoxide.

The danger of carbon monoxide in aviation can readily be appreciated. In this case, oxygen is plentiful; but owing to the affinity of carbon monoxide for hæmoglobin, the effective circulating volume is grossly decreased. Added to this effect are the following factors: (a) Carboxy-hæmoglobin itself prevents the dissociation of that oxy-hæmoglobin which is still available, and the oxygen pressure in the tissues must fall much lower to release it. Thus at an altitude, minute quantities of carbon monoxide become much more dangerous; in fact, the toxicity rises with altitude. (b) There is an effect on the sino-aortic nerve endings, which prevents any increased ventilation, and thus fainting or unconsciousness occurs with even less warning than that produced by oxygen lack.

Conclusion.

In conclusion, the need for prophylaxis against anoxia can be readily appreciated. To instruct members of air crews in the physiological reasons for, and the use of, oxygen and oxygen equipment, is one of the most important functions of the medical section.

TEMPERATURE HAZARD AND PROTECTION.²

By R. DOUGLAS WRIGHT,
Melbourne.

WITH normal environmental temperatures in Australia, the most that ever seems to happen is the occurrence of a few chilblains, and frost bite is practically unheard of. When one ascends from ground level, an ordinary working rule is that the temperature of the air drops by 2° C. for each thousand feet of height; that is to say, at 10,000 feet the air temperature will be in the neighbourhood of 0° C., at 20,000 feet -20° C., at 30,000 feet -40° C. These temperatures for heights are not, however, fixed, and the temperature at over 30,000 feet may well be as low as -50° or -60° C.

The body normally loses heat partly by evaporation of water vapour, partly by conduction and convectional conduction, and partly by radiation from the whole of the body surface. The loss by evaporation, of course, depends on the skin temperature and the amount of water vapour which the surrounding air can take up from the body. As the water vapour tension for fully saturated air is very small at temperatures below 0° C., in low temperatures the loss by evaporation of insensible perspiration is considerably decreased, but that due to loss of water in respired air remains the same. The rate at which heat is lost by conduction depends upon the conductivity of both the donor and the receptor materials, upon the temperature of the two materials and upon the specific heat of the two materials. It will be realized that with increasing height the specific heat of the air decreases, and for this reason the loss by convectional conduction does not increase in proportion to the temperature difference which occurs. Loss by radiation is proportional to the temperature difference between the donor and receptor surfaces and is related to the emissivity of the surfaces. It is in no way affected by the alterations in the air due to alterations in altitude. If we assume an average surface

temperature of the body of 33° C., a drop in wall temperature from a normal 18° C. to a temperature of -27° C. will mean an increased loss by radiation to four times the normal. We must take into consideration here also the problem of changing surface temperature of walls due to the heat received from the radiating body. This depends on the conductivity and specific heat of the material of the wall, and when the wall is backed by another material with a significant heat capacity, the rate at which this material can receive heat from the wall is obviously important. In aircraft structure the wall is, of course, a thin metal sheet, surrounded by air moving at such a high velocity that unless large amounts of heat are poured into the aircraft the internal surface of the fuselage can rarely if ever exceed the free air temperature by any great degree. Finally, we have the problem that radiant heat may be accepted by the outside surface of the wall; there will then be a balance of all the factors previously mentioned with this new factor, and the resulting temperature of the wall will depend upon the rate at which heat is removed by the ambient air and the rate at which heat is received from the sun. An aircraft flying at low altitudes or at rest on the ground may, in tropical climates, have quite a high internal temperature as a result of radiation received from the sun. At high altitudes the temperature cannot be significantly raised by this means. A common analogy in this respect is that of Professor Picard's situation, in which he heated the gondola of his balloon by turning a receptive surface to the sun. The positions are, of course, entirely different; the aircraft creates a wind velocity of over 100 miles per hour along the skin of the plane, while Professor Picard's balloon was in practically still air, for even though he might have been in winds of fairly high velocity, his balloon would move with them.

Having considered the general position, we must now become more specific in regard to the position of a man in these circumstances. There is a central core of the man at a temperature around 38° C.; the whole of the remainder of him is at a temperature lower than this, with a temperature gradient from the deeper parts to the surface parts. In comfortable conditions this gradient is usually from 37° to 37.5° C. at one inch below the skin, dropping to 33° C. at the skin surface. Of course, it is not 33° C. at all points on the surface; but the average is approximately that figure. It is worth while recalling that approximately 50% of the body is usually not more than one inch below the surface of the body. The amount of heat lost in these conditions is about 50 Calories per square metre per hour—that is, a little more than basal metabolic rate. The amount of insulation by clothing required to prevent this loss has been defined as a unit called a "clo" and is equivalent in insulation to an ordinary greatcoat. When the body is subjected to the extremes of climate which are encountered in aircraft, the amount of clothing required is in the neighbourhood of eight or nine "clos". Even if the effect of the addition of individual layers of clothing were additive, nine greatcoats' thickness of clothes would have definite disadvantages, and it must be realized that this unit for mathematical application would be applied to a spherical body. When we are dealing with such thermally extravagant structures as the hands, feet, ears and nose, the problem of heat loss in proportion to the amount of blood which can bring heat to them becomes a difficult matter. It is thus evident that the hands and feet require special consideration, particularly as the vascularity of these structures has the peculiarity that, once having contracted as the result of the application of cold, they do not readily relax except with the application of warmth; thus a frozen hand inserted into adequate insulation remains a cold hand for a long period of time. The extraordinary fact is that frost bite of the extremities is of relatively trifling occurrence when one considers the inadequacy of the insulation applied to them and the fact that most aircraft designs apply these parts of the body to masses of metal which act as heat sinks.

Local cooling is a feature which everybody takes for granted. The dictum of the constancy of conditions in the body, however, makes most people neglect the pos-

¹ A small section of the coloured Royal Canadian Air Force cinematograph film on oxygen, showing the symptoms in a decompression chamber, was exhibited at this stage.

² Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

sibility of a general fall in body temperature. There is, however, plenty of evidence that a cold environment may lower the body temperature to 94° or 95° F. without any great evidence of impairment of bodily functions. Apparently the thermosensitive centre in the hypothalamus normally controls body temperature on evidence brought to it from the temperature receptors of the skin and perhaps on the temperature of the blood arriving at it from the heart. When the temperature receptors from the skin are deceived by immersion of the body in a bath charged with carbon dioxide, the central mechanism fails to set up any compensatory activity until the blood temperature has fallen by 3° or 4° F. A similar failure to behave as a physical thermostat occurs when a person is transferred from a very cold bath to a bath not quite so cold. The heat-regulating mechanisms relax and body temperature falls rapidly. If certain parts of the body, especially the hands and the feet and forehead, are kept warm, the body temperature may fall considerably if sufficient heat-receiving material is in the neighbourhood. It is thus clear that merely to apply heat to indiscriminate parts of the body is not going to overcome severely low temperatures acting on other parts of the body. Even if this danger did not exist, we should have the difficulty of causing a sufficient amount of heat to be taken into the body through the skin. With an environmental temperature of 5° C. below body temperature, the whole of the body surface with a full dilatation of blood vessels is taken up to lose 50 Calories per square metre per hour. It is not safe to apply to the skin temperatures much greater than 6° C. above normal body temperature. It is thus evident that if large parts of the body are losing heat at a rate greater than the basal metabolic rate, it is also not possible to supply sufficient heat locally to small parts of the body to maintain the general temperature. If the metabolic rate decreases in low temperatures, the position becomes even more impossible. It has been demonstrated, in the case of dogs, that an inadequate supply of oxygen does lead to such a diminution in metabolic rate.

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MUSCLE BALANCE AND ITS IMPORTANCE IN THE SELECTION OF AIR CREW.¹

By T. A'B. TRAVERS,

Wing Commander, Royal Australian Air Force.

MUSCLE balance is the relationship between the movements of the two eyes. Normally the movements of one eye should follow the other exactly, in all directions. This demands a high degree of symmetry in the orbits and ocular muscles, and when this perfect state exists the person is said to be orthophoric. Nearly everyone, of course, has some defect in his eye movements, or some degree of heterophoria—that is, some tendency for one

eye not to follow the other exactly. There are various types of heterophoria which indicate the way in which one eye tends to turn away from the other: (i) esophoria, in which one eye turns inwards; (ii) exophoria, in which the eye turns outwards; (iii) hyperphoria, in which the eye turns upwards in relation to the other.

The final perfection of the eye movements is brought about by the cerebral process of fusion, which blends the two monocular images. Thus the eye movements have a dual control: (i) the neuro-muscular reflexes, which link the movements of one eye with the other; (ii) the cerebral process of fusion, which finally perfects the eye movements and keeps the visual axes exactly together.

In normal binocular vision the two eyes act as one organ of vision. Any visual judgement one makes is thus the result of the brain's interpretation of the images from both eyes. The retinal image is only the beginning of the visual process. Therefore, if the eye movements are hindered in any way, one is apt to make a false judgement, because one interprets one's retinal impulses wrongly.

A good example of this false judgement can be seen in a person who has, say, a weakness of the right external rectus muscle, when he attempts to grasp an object on his right side. As he looks to his right side, the right eye does not move as readily as it should. It lags inwards; the patient develops an esophoria. The outward movement of the right eye has to be "pepped up" by fusion, which stimulates the external rectus. The eye is thus moved to its proper position, but in the process the position of the object is wrongly interpreted as being too far to the right.

Therefore it is most important for pilots to have good muscle balance, and the air force lays down in its regulations certain limits of muscle balance defect, between which it is considered that safety lies.

Now, one fallacy of this is that people live with and grow used to their muscle balance defects and learn to compensate their judgements accordingly. One often sees patients with gross muscle balance defects who never have symptoms and who are good at sport. Another fallacy is that muscle balance defects vary from day to day, and vary greatly according to the patient's state of health. But, of course, one must have standards, and it is better to err on the safe side. At present the air force requires good muscle balance only in its pilots; but it would seem desirable in air gunners also.

You will remember that fusion perfects the ocular movements. Fusion enables one to overcome minor muscle defects and so maintain binocular vision. Fusion can be artificially enhanced or trained by certain exercises, and this process is called "orthoptic training". This training improves the powers of fusion, and by so doing enables the subject to cope better with his muscle defects. It also makes the eyes more comfortable by a simple gymnastic process.

Orthoptic training can be used in two main ways in the air force: (i) to alleviate eye strain symptoms that are produced by muscle balance defects; this is a very important and useful role; (ii) to reduce a muscle balance defect that is symptomless and yet sufficiently great to prevent a man from being acceptable according to air crew standards.

Many people are inclined to regard this latter as a rather useless procedure. They argue that, as the patient has no symptoms, you are not doing him good. But surely this is beside the point, and although one may privately regard air force standards with a certain degree of cynicism, the standards are there like the word of God. They must be adhered to, and if one can by orthoptic exercises help trainees to attain the standards, one is doing useful work.

The other subject that I should like briefly to mention is defective colour vision. A defect in red-green perception is a common cause for the rejection of a man for air crew. Such men are often indignant and incredulous; they say: "The doctor said I was colour-blind, what rot! I can see the traffic lights clearly." These people are not colour-blind, but colour "defective". They are apt to mistake the delicate shades of red and green, and so they become a danger when the recognition of faint and distant signals is essential.

¹ Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

THE PREVENTION OF PSYCHIATRIC DISORDERS IN FLYING PERSONNEL.¹

By D. F. BUCKLE, M.B., B.S., D.P.M.,
Flight Lieutenant, Royal Australian Air Force.

IN considering the general field of preventive medicine, we are confronted with a special difference, or complication of the situation, between prevention of psychiatric disorders and, for instance, the prevention of epidemic or infectious disease. I refer to the paramount consideration which must be given to the soil in which such psychiatric disorders flourish: the environment, social and personal; the ideals, cultural and sectional; and the temperament or inherited diathesis of the subjects. These factors have been fully explored in a general way in our peace-time culture by the methods of sociology, economics and anthropology, and contributions have been made by child guidance psychiatrists, by psychoanalysts and by cultural anthropologists.

In military psychiatry we are dealing with a setting about which we know little. There is scant opportunity for thorough and long-continued studies of the effects of the new environment, and it is only gradually that a realization of the basic differences between the war-time and peace-time cultural influences and ideals is emerging.

Certain well-defined differences are at once apparent in the alteration of the combatant's environment, his exposure to danger, his exposure to effects of long-continued strain, the effects of the grouping together of men with a common aim, and the converse effect of a loosening of the combatant's former ties and allegiances; all these factors are acting continuously, requiring an alteration in his philosophy, and are contributing determinants to his resultant personality. It is this kind of emotional readjustment which is required in those who are able to adapt themselves to this new life. In the Air Force certain of these determinants act in a special way, and it is the consideration of these more specific factors which concern us in this paper.

The psychiatric disorders met with in flying personnel fall into several groups: (i) disorders similar to those met with in civilian practice, for example, psychoses, psychoneuroses of various types, psychosomatic disorders of the circulation and alimentary tract, and psychopathic and character disturbances; (ii) disorders with a psychoneurotic symptomatology, in which long-continued flying is a major determinant in the causation; (iii) acute anxiety states, induced or precipitated by exposure to combat.

It will be convenient to deal with each class separately.

Disorders Similar to Those Met with in Civil Practice.

In the prophylaxis of the disorders of the first group, it is obvious that questions of selection are paramount. I do not think there is any special difference here between selection problems for an air force and those of psychiatric selection for combatant services generally.

Interest in the problem can be referred back as far as 1909, when at a medical congress in Nantes, Dr. Granjoux asked: "Why are there crazy people in the Army?" He then answered himself: "Because we do nothing to prevent it." (Helgeason, 1942.) We have progressed a long way since then. In the last world war, the United States Army made a serious attempt to prevent such a state of affairs by the use of psychiatrists on induction boards, and achieved a lower percentage of psychiatric casualties than others of the Allies. In the present war the United States forces have again been well organized in this direction, and both the British and Australian forces have realized the importance of rejecting the psychiatrically unfit and have set up elaborate machinery for such selection (Rees, 1942; Porter, 1941; Ebaugh, 1941, *et cetera*).

¹Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

Here I shall mention, although time will prevent further comment, the problems of differential diagnosis of early schizophrenia; the problem of the subject with the paranoid personality who never adjusts himself to Service life and who is a dangerous and undependable cog in the machine; the problem of those with queer and undisciplined personalities who are often driven into the Services by those who vainly hope the Service will have a therapeutic or corrective influence; the diagnosis of the bright and superficially friendly hysteric; the diagnosis of dull and mentally defective persons, which is now made by the use of psychometrics. All these people present problems of psychiatric technique at times, and as such are usually discovered sooner or later; but these are problems of vocational selection generally, and not specifically related to service or aviation medicine.

There is, however, more to the problem than the mere screening out of those with frank disorders. All writers on the subject have been struck by the prominence of predisposition in the history of the psychiatric casualty (McCurdy, 1918; Cutler, 1941; Whishaw, 1942; Fairbairn, 1943). Such patients may have been sufficiently well adjusted in civilian life and have presented no symptoms at the time of recruiting, but may have broken down more easily than their fellows under conditions of stress. The main lead to the detection of the predisposition is found in the high occurrence of psychiatric disorders in those who have had an unusually protective family environment. Infantile dependence on the parents or parental figures is a feature of the emotional attitude in neurotics, and it has been shown to be present in those subjects who have this predisposition to psychoneurotic disorder. The psychopathology of such cases is well dealt with in psychoanalytical literature, and the attitude is intimately related to the lack of resolution of the Oedipus fixation, producing persons with a "psychoneurotic" personality or subclinical psychoneurosis. This factor of infantile dependence forms the subject of a recent paper by Fairbairn (1943), who considers that the interplay of social (morale) attitudes upon the infantile dependent attitude forms the main core of psychoneurotic psychopathology. This point will be taken up later; but I do not think it is certain that such predisposition exists in all cases, at any rate not in the form of a neurotic personality. The psychiatric history of a patient who is suffering from a psychoneurotic disorder may present apparent symptoms of maladjustment in early childhood which may be unconsciously magnified in importance by the patient, and the picture one draws of the constancy of predisposition in the history might have been different if one had examined the same subjects before their breakdown.

From the point of view of the practical problem of selection, the detection of such predisposed persons presents difficulties. They can be detected by interview; but such interview must be necessarily lengthy, and certainly medical or psychiatric in its orientation; it must also include a thorough family history. Attempts are being made to detect the predisposed by objective testing methods (Bigelow, 1942) such as biographical *questionnaires*, group Rorschach testing and the like, so far with little positive result beyond that of a fairly low correlation between ratings on such methods of testing and success in adjustment to the new environment.

Such methods are not sufficiently precise for practical selection and usually merely serve as confirmatory evidence in the diagnosis of subjects with overtly abnormal, maladjusted personalities.

One of the prominent facts militating against the use of such testing methods is the lack of information as to the effect that the positive and helpful features of the new environment may have on the relatively infantile or undeveloped subject. There is much evidence that psychiatric judgement as to emotional factors, whether or not aided by testing methods, is inaccurate in the case of younger subjects who have psychoneurotic personalities to a subclinical degree, but that it is more and more valid as the age of the subject increases. This is due to the lesser influence the new environment will have in releasing the constriction and fixed maladjustments of the older

man, and consequently the greater ease with which the effects of the new environment may be predicted.

These problems, the detection of infantile dependence, and its corollary, the discovery of the amount of keenness or incentive available in the entrant or young trainee, are being examined constantly by those in whose care he resides. Although the factors on which their selection is based are psychiatric, the actual selection is made by physicians, administrative officers and training officers, who have such factors perhaps not so clearly before them. The actual selection is not, and need not be, entirely the province of the psychiatrist; but the psychiatrist can aid by a more extensive and more precise examination and elucidation of the variety and complication of emotional and social factors concerned.

Disorders in which Long-Continued Flying is a Causative Factor.

The second group of psychiatric disorders to be discussed includes those in which long-continued flying is of major importance in the aetiology. In this case we must deal with those factors of the soil (or predisposition) which are of importance, and the influence of the specific environment, the flying. It is convenient to take these in the inverse order and consider, firstly, flying and the influence of fatigue.

Flying, as such, when not interfered with by the enemy, is not dangerous—or rather, it is not so fraught with danger that the flier should be affected adversely. That pilots can fly for long periods, provided the general principles of industrial health and industrial psychology are observed, is amply demonstrated by the performance of civil pilots. The pupil pilot is, however, in a different position; he cannot escape, at the beginning, the emotion of fear and a feeling of tension, and in the early stages of his course he requires a great deal of sleep and mental relaxation. A pupil will often say that during his elementary course, one hour's flying caused a need for fifteen hours' sleep. As the feelings of tension disappear with familiarity, the need for such rest is reduced to normal proportions. A small number of pupils break down during early training with the symptoms of acute anxiety or complete loss of confidence to carry on; but these are cases in which the predisposition is so clear that the pupils may be regarded as psychoneurotics who have been recruited owing to inefficiency in selection. It has been found that, if an attempt is made to persevere in the training of such pupils to fly, their prognosis is hopeless for further military service (Anderson, 1919).

Fatigue is a complex state arising from the interaction of two variables; firstly, it is proportional to the amount of bodily exhaustion, and may be mitigated by attention to hours of duty, food, hygiene *et cetera*; secondly, it is inversely proportional to the amount of available extraverted energy of the organism. In practice, the factor of amount of bodily exhaustion is dealt with by application of general principles of hygiene; but the factor of the amount of available energy requires further elucidation.

Although the extraverted energy of a subject is derived from the same vital urge which is transformed into instincts and their expression, it is heightened or diminished by the amount and quality of stimuli from the environment. It is the function of the ego to reconcile and discriminate between stimuli from instinctual sources, from the demands of environment, and from the formation of ideals. In this connexion its most important mechanisms of adjustment are those of repression and sublimation. In the case of the person predisposed to psychoneurosis, a continual adjustment by repression is necessary, and such persons can never properly and continually exert the maximum amount of energy in a situation; they have therefore less reserve of energy to draw upon and are consequently more liable to fatigue for this reason.

With regard to the stimuli from the environment, there are two main factors: (i) the heightening of the group spirit, with consequent sublimation of libidinal energy into the fulfilment of the ideals of the group, and (ii) the action of fear in intensifying the

infantile conflicts, with repression on the one hand and a strengthening of the fixation to infantile ideals on the other.

Flying fatigue, then, as a syndrome, is dominated by various quantitative variables: (i) physiological exhaustion, (ii) fear, anxiety or "strain", (iii) the morale of the group, (iv) the personality of the subject. Flying fatigue is more readily produced in conditions of bad weather flying, in flying over sea, in the instruction of incompetent and therefore potentially dangerous pupils. Certain instructors who are temperamentally unsuitable by virtue of their inability to enter into the emotional relationship required between instructor and pupil are constantly battling against the effects of repression, which have been excited by a situation with which they cannot cope.

The heightening of group spirit—the morale of the group—and conversely, its diminution by factors affecting morale (dissension, despondency, lack of confidence in superiors), are important in flying fatigue.

It has been stated by observers in both this and the last world war that when there is a regional relative lowering in morale, the number of psychiatric casualties is higher. An air force under present-day conditions operates under the special difficulty of necessarily having scattered and isolated squadrons and flights, often in temporary situations and without proper quarters, food or recreational facilities. The importance of improving conditions as far as is expedient in these outlying and isolated units is realized to be a major factor in ameliorating an environment which is productive of psychiatric disorders.

The personality of the subject with regard to the amount of infantile dependence and the ease with which he can regress to earlier emotional levels—that is, the strength of fixations on childhood images, ideals and objects—is another factor. There are, of course, as is seen in the analysis of all psychiatric disorders, many other contributing personality factors; but although certain of them may have more importance in particular cases, their importance generally is not great.

Birley (1920) describes a typical picture of a "stale" flier in the Royal Air Force as one having lost keenness and become discouraged and uncertain of himself in the air.

He loses flying judgment and has to force himself to go into the air. He is irritable, short of breath, and he attributes his condition to trivial causes. He sleeps less soundly and dreams of unpleasant flying experiences. Various kinds of mental conflict such as indecision concerning the desire to fly and feeling unequal to the task, lead to complications involving loss of nerve and morale at times suggesting the beginning of an anxiety neurosis. As his condition develops, he is eventually grounded, not only temporarily, but permanently. The rate of the onset is gradual and is associated to some degree with the respiratory condition of the flier. The first symptoms show an altered condition of the tone of the respiratory centre of such kind that the regulation of breathing is no longer normal. There is also a loss of control in the voluntary system, lessened force of cheek and mouth muscles, and loss of tone in the stomach and bladder walls. Frequently, there is slight inco-ordination of the finer muscular movements and noticeable tremor of the finger and tongue.

The prevention of psychoneurotic syndromes arising as a result of flying fatigue, and of the syndromes of gross diminution of incentive (boredom, "fed-up-ness", being "browned-off") is thus concerned with the "screening out" of the predisposed recruits, with morale, and with physical and mental hygiene; a great deal has been achieved both in the Royal Air Force and in Australia by constant attention by the medical officers to the last-mentioned. Clinically, the question of morale is dominant. Fairbairn quotes himself as saying, after a disillusioning experience of neurotic service men *en masse*: "What these people really need is not a psychotherapist, but an evangelist." I think every practising Service psychiatrist has at some time or other been driven to making a similar remark. Although the psychiatrist may make a contribution to the study of morale, the application of principles in keeping and heightening group spirit is the affair of the Service as a whole (Dawson, 1941).

Acute Anxiety States Precipitated by Combat.

I now turn to the third class of psychiatric disorder, the acute anxiety state precipitated by combat. Here we are on the familiar ground of shell-shock or battle stress. I believe this disorder to be quite distinct from the more chronic and insidious psychoneurosis produced by flying fatigue. Men afflicted by the latter condition have in their symptomatology signs of complicated ego adjustments; conversion and compulsive symptoms predominate, and their therapy by analytic means is complicated and uncertain. In the acute psychoneurosis of combat we have, in the first week, an uncomplicated anxiety state, with tremors, nightmares, acute anxiety feelings, incompetence, sleep-walking, starting at the slightest noise, loss of appetite, depression and fugues. The anxiety arises from acute conflicts induced by fear and an unconscious dominating impulse to be removed from the environment, even at the cost of suicide. It is undoubted that some persons stand up better than others to operational or battle stress, and the same factors as are of importance in selection, which have been discussed previously, are again relevant.

The important point in the differentiation of this acute syndrome is in its outcome. Unless it is treated promptly, the patient's own ego takes a hand and makes attempts at adjustments, which usually fail, but which produce the relatively intractable conversion or obsessional syndromes. Treatment in the acute case is a medical emergency, and must be carried out within the first week, preferably in the battle area (Cooper and Sinclair, 1942). Treatment may be abreactive, psychoanalytical, narcoanalytical or hypnotic, with the full use of sedatives, and must be considered of major importance in the prevention of those chronic psychoneurotic disorders which lead to discharge and to repatriation and rehabilitation difficulties.

Conclusion.

In summary, there is a kernel of thought which is the centre of all discussion as to prophylaxis; this is, to recognize the predisposed subject—the subject who is dominated in his psychological make-up by infantile dependence, which is the soil from which psychoneurosis develops; to realize that servicemen show all degrees of this predisposition, and to realize that the only factors which can overcome the tendency to breakdown in those of a certain critical degree of such predisposition are those positive factors of heightening of group spirit, with release of energy into group goals, and the setting and encouragement of positive ideals, which come under the headings of propaganda and fighting spirit.

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OCCUPATIONAL CONDITIONS OF THE EAR AND NOSE IN AIRMEN.¹

By NOEL E. H. BOX,

Wing Commander, Royal Australian Air Force.

THE changes of altitude met with in flight expose the subject to great variations in atmospheric pressure, often rapidly and repeatedly under service conditions. The atmospheric pressure at sea level is fourteen pounds to the square inch. At an altitude of 18,000 feet, this pressure is reduced by half.

Pressure Effects on the Eustachian Tube.

In the normal subject, the air contained in the nasal accessory sinuses passes in or out of the ostia as the pressure varies. In the tympanic cavity, the matter is not quite so simple. The middle ear cavity differs in several respects from the nasal sinuses. Its walls are not formed entirely of unyielding bone. A considerable area is formed by the drumhead, which is elastic but frail. The communication with the respiratory passages is via the Eustachian tube—a complex structure of bone, cartilage and membrane. At rest, the tubal lumen is closed. It is opened by the muscular action of tensing the palate (as in swallowing), and it is also opened when the pressure of the middle ear air content is raised to the extent of a few millimetres of mercury above that of the pressure of the external atmosphere.

During ascent the Eustachian tube opens spontaneously every few hundred feet, and allows an approximate equalization between the intratympanic and atmospheric pressures. A decrease of intratympanic pressure in relation to atmospheric pressure has a different effect on the Eustachian tube. The increased external pressure causes the normally closed tube to act as a valve, and muscular action is required to open it and equalize the intratympanic and atmospheric pressures. If the atmospheric pressure has been allowed to rise to 80 or 90 millimetres of mercury above that of the intratympanic pressure, muscular action is no longer able to open the tube. During descent, the subject must voluntarily open the Eustachian tube by muscular action.

In civil practice, it is found that anatomic structure has a great influence on the course of acute and subacute sinus infections.

A subject with relatively large communications between his sinuses and nasal passages has a much better prospect than one with small communications. Quite a mild degree of mucosal congestion will block a narrow ostium and seal off the cavity. This may lead to an empyema in a severe infection, and even in a mild congestive infection of subacute type it may lead to a "vacuum" type of sinus headache. This condition in many respects resembles the "vacuum" type of headache from flying; but the flying type is likely to be much more painful.

Congestion of the nasal mucosa is the primary factor in either type of headache, and a restricted communication between the sinus and the exterior brings about a predisposition to obstruction. In the former type of headache, the air content of the sinus is thought to be absorbed by the congested lining membrane. There are other possible explanations of the relative vacuum. In the latter type, any exaggeration of the congestion at higher altitude may close the orifice, and descent into a denser atmosphere entails an increasing external pressure in relation to that in the sinus. When the descent is rapid, the pain may be agonizing.

The frontal sinus is most frequently affected in both the catarrhal and flying types of "vacuum" headache. It alone of the nasal sinuses communicates with the air passages by means of a tube, and a tube more readily holds an obstruction against pressure. The inhalation of

¹Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

"Benzedrine" vapour is likely to have a dramatic effect on the "vacuum" type of sinus pain. The congestion is rapidly lessened, and if this is effective in dealing with the obstruction, a gurgle is heard, and the pain soon ceases.

Acute or subacute catarrhal *otitis media* is a common condition in civil practice, as an extension of a seasonal nasal catarrh. The drumhead is retracted and more or less injected according to the acuteness of the condition. The Eustachian tube is obstructed by a congested lining mucosa. A mild condition of this type would lead to exaggerated vacuum effects in flight. There would occur a considerable leakage of the tympanic air content if the ascent were to much more than 3,000 or 4,000 feet, and an obstruction of the tube during the descent would be likely. All efforts at voluntary opening of the tube might fail. If the descent was continued, the drumhead would be forced still more firmly inwards against the inner tympanic wall, with a pronounced traumatic effect.

Otitic Barotrauma.

In the condition known as otitic barotrauma, pain and deafness are constant symptoms. Tinnitus is usual, and vertigo is less common. The degree of trauma will depend on the altitude and the rate of descent. Rupture of the drumhead or hæmatotympanum may occur if a rapid descent is continued. There is a prospect of opening the tube by forced autoinflation, especially if a reascent is made as soon as symptoms are experienced. The tube may be kept open by forced autoinflations during descent, and trouble may thus be avoided. A descent must be made sooner or later in any case. If the blockage has persisted, the symptoms will increase as altitude is lost. If the tube is not opened by medical measures during the next hour or two, a reactionary stage is reached. The acute traumatic process extends, and the tube is sealed off for days. Permanent damage may result. Otitic barotrauma is much more frequent in flyers than vacuum sinus pain. Congested mucosa is not an essential factor in the aural manifestation. The neglect of voluntarily opening the Eustachian tube during descent may bring the condition on in any subject, and when pain occurs, it may then be too late to open the tube. Airmen who return to flying duty before an attack of acute otitis barotrauma has subsided are likely to develop a chronic form of the condition. Pain is experienced at every flight, and the ear becomes progressively more irritable.

Hearing.

War conditions have given us some further information about occupational deafness. This condition has long been recognized as an inner ear type of deafness caused by long exposure to noise of great intensity. The boiler-making industry is an extremely noisy one, and because of its incidence in this industry, the condition was commonly known as boiler-maker's deafness. Hearing tests performed on men who are regularly exposed to engine noise at close quarters have shown that a hearing defect soon develops in a circumscribed area of the human hearing scale. The area affected is in the region of 4,096 cycles, which is a little higher up the scale than the highest basic tones of the human voice. For this reason, the hearing of speech is not affected at this stage, and the subject is quite unaware of any hearing defect. The condition is a slowly progressive one in the average case. Some people are particularly susceptible, and the condition in them progresses more rapidly. In time the defect becomes a pronounced one in the 4,096 cycle area; but it is still a latent lesion. At a later stage, neighbouring tones both up and down the scale become involved. When there is an appreciable defect at 2,048 cycles, the hearing is defective for high-pitched speech sounds such as those of "S" and "C". When involvement of hearing occurs still lower down the scale, at 1,024 cycles, the subject is manifestly hard of hearing.

At this stage, the hearing tests reveal a typical inner ear type of deafness. The upper tones are completely lost, and hearing progressively improves as the scale is

descended. Bone conduction is decreased, and the Rinne test produces a positive result. The lesion is a permanent one, and management is purely prophylactic.

Properly fitting ear plugs or headphones screen off approximately thirty decibels of intensity, and the noise to which the ear is subjected is left below the danger line, which is approximately eighty decibels.

PROBLEMS OF ACCELERATION.¹

By W. J. SIMMONDS, B.Sc., M.B., B.S.,

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THE topic which is immediately associated in our minds with problems of acceleration is, of course, the effect of change of direction with consequent subjection of the body to centrifugal force. I think, however, that we may profitably review the wider implications of the subject.

There are three types of acceleration, each of which plays its part in the effects of flight upon the flier. These different aspects of acceleration are: (i) linear acceleration, (ii) movement of a body in a curved path constrained by centripetal force, (iii) angular acceleration.

Linear Acceleration.

Let us first consider linear acceleration and deceleration. This consideration will provide a measure of the force acting on the pilot's body in catapult take-offs, in the opening of a parachute in mid-air, in parachute landings and in crash landings. In the three last-mentioned, deceleration is under consideration.

At this stage it seems necessary to outline two simple and well-known mathematical facts. Firstly, the force of gravity imparts to a body falling towards the earth's surface an acceleration equal to 9.81 metres per second, per second. Henceforth it will be convenient to refer to any acceleration of this magnitude, whether produced by gravity or not, as 1G. The mass of a body multiplied by the acceleration to which it is subjected is the weight of that body. Thus the weight of a body would be slightly different at the equator from what it would be at the poles, although its mass would remain constant. If an object of known mass is suspended on a spring balance, the degree of extension of that spring is an expression of its weight and therefore of the number of G's to which it is subjected; this is the simple accelerometer. In any reference to centrifugal force, for the purpose of brevity the force itself will be expressed as multiples of G. Secondly, the acceleration or deceleration producing a known change of velocity is proportional to the square of that change of velocity and inversely proportional to the time or the distance required to produce that change.

A person falling without a parachute from a height of one kilometre would, owing to the frictional resistance of the air, reach a final velocity of 130 miles per hour; he would thereafter fall at that rate and would be driven a foot or so into the earth. The deceleration imparted to his body by the fall would thus be -360 to 720 G, and for a man weighing ten stone this would be equivalent to his attempting to support a weight of 22.5 to 45 tons. If he opens his parachute when he has decelerated to 130 miles per hour, the parachute will slow his descent to ten miles per hour, let us say. If he falls 30 yards before the parachute is fully open, he will be hanging on the straps with a weight six times his own. If, when he lands, his knees bend so that the deceleration is acting through a distance of about 1.5 feet, the force of impact is such that he must support only 3.5 times his weight, which is quite possible.

¹Part of a symposium on aviation medicine, read at a meeting of the Victorian Branch of the British Medical Association on June 2, 1943.

In the case of crash landings, we can see the importance of crash helmets and of proper disposition of the body especially the head. Thus, a smooth deceleration over the maximum possible distance acts upon the largest available area of the body. The distance factor is of greater practical importance than the area.

Centrifugal Force.

Let us now pass to the second aspect of our subject—centrifugal force. In this we find a difference, in that the accelerations and decelerations mentioned earlier act for a moment, whereas centrifugal forces in flight may act for four to eight seconds or so on the body. These forces may range up to 12G; but it is unlikely that this figure will be exceeded for some time.

The types of aerial manoeuvres in which centrifugal forces are applied to the body are exemplified by turns, loops and rolls. In a correctly made turn, the resultant of centrifugal force and gravity will act in the long axis of the pilot's body from head to feet. This is conventionally referred to as +G's. In an outside loop the direction of the force is reversed, and this we refer to as -G's. The

magnitude of force is proportional to $\frac{v^2}{r}$

Let us first consider the caudally directed force. We can see that it may produce varying shifts of soft tissues, supporting tissues, organs and fluids in the body. Its effect on soft tissues may be demonstrated in photographs of the pilot's features at varying rates of turn. As the number of G's increases, the corners of the mouth and eyes are drawn down, the cheeks sag, and the face of the pilot becomes that of a weary, sad old man. Immediately the manoeuvres and the centrifugal forces cease, the features return to normal. The musculo-skeletal system is not a limiting factor in the pilot's resistance to centrifugal force. It should be mentioned, however, that a force of 4G applied abruptly is adequate to break the leg bones of a standing man, and that even a powerful man can resist 4G gradually applied for a mere 10 to 15 seconds before his muscular support fails. This has obvious application to the transport of air-borne troops when they are eluding interception.

In the case of a seated pilot, although the increase in weight of his limbs at an applied 5G may make movement almost impossible, he is in no danger of compression fracture of the spine or analogous injuries under a gradually applied G of 10 or even more. In the case of the suspended organs of the body, the effects are again relatively minor. A dragging sensation in the abdomen or even subcostal pain due to stretching by liver or spleen of their attachments is fairly common. There may be a peculiar and unpleasant sensation in the thorax due to a drag of the heart on its mediastinal pedicle, with slight embarrassment of its function.

The major effects of centrifugal force, from the standpoint of the pilot's efficiency, are hydrostatic. There are, of course, in the body two main systems of fluid enclosed in somewhat distensible conduits—the cerebro-spinal and the cardio-vascular.

Pressure differences in the cerebro-spinal system, although they must be of considerable magnitude, have not as yet been shown to play an important role in the production of symptoms.

By far the most important effect of centrifugal force is upon the cardio-vascular system. In this regard we are concerned firstly with a dual physical effect, and secondly with a series of physiological adaptations. The physical effect of the centrifugal force acting from head to feet is, firstly, to increase the load on the heart and set up a greatly increased pressure gradient from heart to head, and secondly, to decrease the filling of the heart and set up a greatly increased pressure gradient from feet to heart. With a force of 7G the blood would be as heavy as iron, and so, even if the blood pressure at the arch of aorta was 130 millimetres of mercury, the blood pressure at head level would be 130 millimetres minus twenty inches of iron instead of minus twenty inches of blood—that is, of course, if hydrostatic pressure was the only

factor concerned. In similar fashion, the effective venous pressure at the heart level would be greatly reduced. One must emphasize the paramount importance of venous return. Arterial pressure is limited by effective cardiac output, which in turn is limited by effective venous return. Efficiency of venous return is almost certainly the limiting factor in "black out".

Since the body is an extremely well-balanced mechanism the sequence of events is not so clear cut. True, the application of +G's is followed after a short latent interval by a fall in blood pressure. This latent interval is a consequence of the inertia of the circulating fluid. However, the fall in blood pressure is much less than that calculated on hydrostatic principles. Moreover, if we plot the fall in blood pressure against the applied G, we get a logarithmic curve indicating that with an increase in G there is an increasing reaction to its effects. So far as we can determine, this partial, ineffective adaption to increased G consists of an acceleration of the heart beat and an increase of peripheral resistance. Promoting the venous return we find an increased depth of respiration (at the lower G's) and possibly increased muscle tone. The importance of the venous return is exemplified by the snake experiment, in which a snake is held head uppermost. Pooling of the venous return produces unconsciousness. If, on the other hand, the snake is immersed in water, this tendency is counteracted by the hydrostatic pressure of the water, and no ill effect is produced.

One might ascribe to the sino-aortic mechanism a considerable importance in the production of a reflex rise of blood pressure to help counteract centrifugal force. However, some continental authorities state that the latent period is too prolonged for the compensation to occur in the four to eight seconds of application of force.

From the pilot's point of view, the most important effect of centrifugal force is the "grey out" of vision followed by "black out" at G's varying from 3.0 to 5.5. The exact mechanism of production of this symptom is, it must be admitted, as yet undetermined. The classical theory is that the intraocular pressure of 20 millimetres of mercury conspires with the lowered pressure in the retinal artery to produce slowing of the retinal circulation and consequent anoxia of retinal cells before cerebral symptoms are produced. If the centrifugal force is sufficiently great or sufficiently prolonged, unconsciousness supervenes on "black out", owing, no doubt, to cerebral anoxia.

It must be emphasized that the effects of centrifugal force are a product of the number of G's and the time of application. In fact, for a given symptom, a strength-duration curve, closely resembling that for excitability of a nerve fibre, may be constructed.

The symptoms so far discussed disappear soon after the centrifugal force ceases and leave no after-effects. There is, however, a less well-known manifestation of prolonged or intense centrifugal force consisting of prolonged collapse closely resembling shock and due, no doubt, to paresis of the walls of the over-filled blood vessels below heart level.

In the case of a pilot performing inverted aerobatics, we find the centrifugal force acting from feet to head. The symptoms of -G's, to follow the convention, would be explained by a reversal of the state of affairs described previously. There will be "red out", "black out", then unconsciousness; but there may be in addition subconjunctival and even cerebral hemorrhages. Symptoms do not disappear immediately the force is removed, and there may follow a confused state resembling that of recovery from concussion. Moreover, a much smaller centrifugal force represents the limit of tolerance.

When one considers the limitations imposed on aircraft performance by the effects of centrifugal force on the pilot, it is natural that the fighting forces should ask the medical profession: "Can you select for us those personnel fittest to withstand G? What factors affect a man's tolerance to G? And what measures can be taken to improve that tolerance?" Unfortunately, any reply to these questions tonight must of necessity be unsatisfactory.

From physiological principles, we might deduce that the short-necked, burly subject with a short head-to-heart distance would have a better tolerance than the asthenic type. It does not follow from the physiological principles, however, that the person with a lower mean blood pressure is less resistant than one with a higher mean blood pressure. To follow out this argument in detail would consume too much of the little remaining time.

It can be seen that every measure to maintain vascular and muscle tonus is of value—exercise, avoidance of excesses of all kinds, adequate oxygen supply. High G's must be forbidden shortly after an attack of influenza and similar maladies which leave the patient "limp". The posture of the body will play a considerable part in the resistance to G. When it is in the prone or supine position, the force acts transversely to the main blood columns. If the feet are raised and the head is lowered, the pooling effect below and the draining effect above heart level are considerably decreased. Firm contraction of the abdominal muscles and various methods of applying pressure to the outside of the body, by minimizing venous pooling, help to maintain the cardiac output and increase the resistance to +G's.

It must be emphasized that against -G's the pilot has no protection beyond minor vasomotor adaptations. Fortunately, the necessity for manœuvres involving -G's rarely arises.

Angular Acceleration.

Time allows but a brief mention of the fact that angular acceleration may be a factor in the production of airsickness, and by stimulation of the semicircular canals may be the source of much confusion to the aviator, gyrating with his three planes of reference. For example, if the plane rolls to the left too slowly to stimulate the canals and then recovers rapidly, the pilot under the hood may be persuaded that the plane has in fact rolled to the right. Thus we may find the pilot leaning to the left on a straight and level course until the effects of the stimulation pass off.

Conclusion.

In conclusion, many a raw recruit to the ranks of aviation medicine express his appreciation of the facilities offered by the Service for the study of that important subject, and his gratitude to his mentors and associates for their friendly criticism and assistance in the preparation of this paper. It should be emphasized that the views expressed in this synopsis do not necessarily represent those of the Services.

Reports of Cases.

REPORT OF A CASE OF FÆCAL FISTULA TREATED BY OPERATION AND "SULFA-SUXIDINE".

By H. S. STACY,
Sydney.

FOLLOWING successful treatment of infections due to streptococci, pneumococci, meningococci, staphylococci et cetera by the sulphanilamide group of drugs came the discovery that the *Bacillus coli communis* in the alimentary tract was susceptible to drugs allied to this. One of these was sulphanilylguanidine, which in the present war is being successfully used for dysentery.

At a meeting of the 118th General Hospital (United States Army) in Sydney some months ago, Captain Schumacher spoke favourably of succinyl sulphathiazole (trade name, "Sulfa-suxidine") as a likely improvement on sulphanilylguanidine. In a personal communication he referred me to Edgar J. Poth's articles in *Archives of Surgery* of February, 1942, and in *The Journal of the American Medical Association* of September 26, 1942.

Recently I was able to observe the effect of "Sulfa-suxidine" on a patient of mine suffering from a fecal fistula

of the transverse colon, which had resisted several attempts at closure. He was given 183 tablets (each of 0.5 gramme) prior to operation; as he weighed 135 pounds, he was given nine tablets every four hours for the first twenty-four hours, and after that five tablets every four hours for five days. The tablets were pulverized and suspended in water; there was no gastric or other upset. After the operative closure of the fistula he was given 188 tablets; that made 371 in all.

Dr. Shearman reported as follows on the bacteriological examinations of the feces from the fistula before treatment and after 183 tablets had been taken:

Before treatment, the colonies of *Bacillus coli communis* were uncountable, numbering apparently between 750,000 and 1,000,000 per gramme of feces; after treatment, the number of colonies was approximately 3,400 per gramme of feces.

With the exception of a small amount of fecal discharge on one occasion and slight wound sepsis, the convalescence proceeded without incident, and the patient was discharged from hospital, cured, in four weeks. I think I may state that the great reduction of the bacterial content in the bowel contributed to this result.

Comment.

In cases of subacute intestinal obstruction and in preparation for colonic and abdomino-perineal resections et cetera "Sulfa-suxidine" has proved of great value. It arrests distention, and the bowel can be freed of fecal material equally well by the use of "Sulfa-suxidine" as by the use of purgatives and enemas. It is not absorbed from the alimentary tract, so is not of value for *Bacillus coli communis* pyelitis and other *Bacillus coli communis* infections outside the bowel. Sharp and Dohme (United States of America) are the manufacturers; Potter and Birks are the Sydney agents. The drug is expensive and hard to obtain.

TWO CASES OF BENIGN TERTIAN MALARIA IN CIVILIANS.

By L. P. WINTERBOTHAM AND FELIX ARDEN,
Brisbane.

Two cases of benign tertian malaria have been encountered lately in Brisbane.

Case I.

T.K., aged thirteen years, a schoolboy, was well through Easter (April 25) and away at Murwillumbah. His present illness started on April 27, when his mother said he was feverish, had a slight headache and was inclined to vomit. Rigors started on May 4 and occurred about midday each day. He was examined by one of us on May 8 and again on May 9 while he was shivering. Examination of a blood smear taken on May 11 revealed a heavy infection of benign tertian malarial parasites (*Plasmodium vivax*). The boy lives about half a mile away from an Australian general hospital where cases of malaria are under treatment. His brother, who has been back from Timor for some time, slept at home until Easter and had his last malarial shivering attack last December.

Case II.

J.E., aged five years, was admitted to the Hospital for Sick Children on the afternoon of May 13. His tonsils had been removed two weeks previously, and since then he had been a little feverish every afternoon. On each of the past four days a rigor had occurred about noon. The attacks would begin about 11 a.m., when he complained of feeling cold. By 1 p.m. he would be shivering violently, although his skin felt hot. He would then sweat profusely, and by tea-time would be, in his mother's words, "as right as rain". His mother was most emphatic that the attacks were repeated every day.

On his arrival at hospital he had a temperature of 101° F. and was just recovering from an attack. His temperature was subnormal next morning, but after a typical rigor it rose to 102.8° F. at 2 p.m. Exactly the same events occurred on the following day. Meanwhile examination of his blood films had revealed a large number of benign tertian malaria parasites. The red cells numbered 4,200,000 per cubic millimetre; the hemoglobin value was 75%. His spleen was palpable a finger's breadth below the costal margin.

Treatment with quinine sulphate (five grains three times a day) was commenced two days after his admission to hospital. No further rigors occurred and the parasites promptly disappeared from the peripheral blood.

This boy had not been away from Brisbane for many months. He lived in an outer suburb within a few hundred yards of an army convalescent depot.

Comment.

There is strong presumptive evidence that local mosquitoes conveyed the infection to both these boys from convalescent soldiers. It is a coincidence that both of them had daily rigors, presumably as the result of being bitten on two successive days.

A CASE OF MEMBRANOUS CONJUNCTIVITIS.

By F. J. B. MILLER,
Temporary Major, Australian Army Medical Corps.

Clinical Record.

I.L., a young aircraft woman, was admitted to a women's service hospital in Queensland on March 10, 1943. She gave a history of sore eyes without much discomfort of three days' duration; otherwise she was in good health and had had no previous eye trouble. She was seen by me in consultation on the same day. On examination, slight photophobia was present, but there was very little discharge; however, the conjunctival surfaces of the upper and lower lids of both eyes were covered by a thick membrane. Attempts to separate it caused slight hæmorrhage. In a swab taken at the time, before treatment was commenced, numerous polymorphonuclear leucocytes were found; but no organisms were discovered on examination of a direct smear or grown on attempted culture. Bathing goggles and drops of acriflavine (1/4,000) were ordered. A subsequent culture from a piece of the membrane yielded a growth of *Staphylococcus albus* only. At the end of ten days the membrane had separated from the lower lids; but it took sixteen days for the upper lids to clear. On March 30 the lower lids looked normal; but examination of the upper lids disclosed some scarring on the tarsal surface. The patient was comfortable and the vision was $\frac{1}{2}$ in each eye. The course of the disease was afebrile and she felt well throughout.

Acknowledgement.

I am indebted to Captain M. Mackay, the officer in charge of the hospital, for permission to publish these notes.

Reviews.

PROPOSALS FOR THE FUTURE OF MEDICAL PRACTICE.

DR. CHARLES BYRNE has written a book which he has called "Proposals for the Future of Medical Practice".¹ This book deserves to be read by all of the many medical practitioners in Australia who are able and willing to study the subject with a view to helping in the formulation of a sound policy. The appearance of the book is opportune on that account as the medico-political forum is being worked overtime at present, and the arguments adduced in the book will help to prevent the repetition of errors in thinking.

The author has tackled his subject along medical lines. He has attempted to take a history, make a diagnosis and outline treatment. He has also attempted to face the problem without bias, and any bias that may appear is probably subconscious and unintentional. There is plenty of evidence of wide reading and time-absorbing sifting of the facts. The book bears the stamp of sincerity and its whole tone is constructive, even to the point of the advocacy of idealism. Some of his deductions from the evidence would appear at this stage to be impracticable, and few

students of the subject are likely to agree with him *in toto*; the prediction of the ultimate abolition of contract practice and the introduction of restrictions to circumscribe private practice will not find wide acceptance. However, many will find little difficulty in supporting at least some of the main proposals offered by the author.

In the opening chapters Dr. Byrne has analysed the faults of the present system of medical practice and has attempted to see them from both sides of the fence. His analysis is first rate. He has claimed that the tests which should be applied to any scheme are two in number. The scheme should, on the one hand, be a complete one and equal to the best at present available, and, on the other hand, should make provision for the elimination of the faults of present-day medical practice.

The specifications for an acceptable medical service would have to include provision for (a) an equitable distribution of doctors; (b) increased coordination between the several branches of medicine; (c) group practice; (d) improved status, working conditions and efficiency of the general practitioners; and (e) financial arrangements to prevent excessive charging and to bridge the financial gap between the cost of such a complete medical service and the ability of the consumer to pay for it.

In another chapter Dr. Byrne discusses the socialization of health services on the assumption that the plan would involve the replacement by the State of all private enterprise connected with health. He observes with reason that such an experiment would be unique in a non-socialized state. It would appear unnecessary to go any more deeply into the matter; the arbitrary compulsion of one section of the community to hand over all its assets and responsibilities to the State without any attempt at equality of sacrifice on the part of other sections can hardly be regarded as just.

Arising like a phoenix from the ashes of a detailed criticism of the three main proposals recently under consideration by the Branch Councils of the British Medical Association in Australia, emerges what has come to be known as the "fee-for-service" proposal, which is the climax of the book. The author clears the way for it in a convincing short chapter on the relationship of cash benefits to medical benefits. He makes it clear that medical services must have no connexion with any cash benefits and that the solvency of the cash benefits side of any scheme will depend on the careful policing of sickness certification. Dr. Byrne has convinced himself that instead of checking certificates, certifying medical officers should be appointed to issue the certificates, acting in close liaison with the treating doctor to ensure mutual assistance and to secure accuracy and honesty.

In conclusion, it is desirable to summarize Dr. Byrne's proposal. He advocates that the basis for any scheme for a government-controlled medical service conducted on the fee-for-service principle should (a) provide a complete medical service available to all; (b) be financed by a special government fund; (c) include schedules of fees not only for registered consultants and specialists, but for general practitioners; (d) provide for payment of a fixed proportion of the fee from the fund and the remaining smaller proportion by the patient; (e) provide for payment of the medical staffs at public hospitals by means of subventions from the fund apportioned in proportion to value of service rendered; (f) include arrangements for hospital charges on a fixed bed-day payment basis apportioned between the fund and the patient; (g) provide for the appointment of salaried medical officers to issue certificates for cash benefits; and (h) be controlled by committees with power to prescribe policy, to arrange finance and to exert disciplinary action.

The book can be commended for careful reading; but at the same time the Federal Council's discussions have shown that most practitioners have sufficient faith in the system of private practice now in vogue to hope that something much less revolutionary will be the outcome when negotiations now in progress between the political and medical organizations are ironed out. An outstanding feature of Dr. Byrne's proposals is that he advocates the maintenance of some degree of retention of private control of his practice by the doctor in the interests of his patients who collectively form the community.

Dr. Byrne has also taken the opportunity that the publication of the book has afforded him to interpolate his advocacy of the establishment of a chair of preventive medicine or paediatrics or both at each of the medical schools. That proposal, of course, gives point to the desirability of expanding the knowledge of preventive medicine and applying that knowledge for the improvement of the health and happiness of the community.

¹ "Proposal for the Future of Medical Practice: An Analysis of Proposed Schemes for a National Health Service and an Outline of a Scheme to Provide a Complete Medical Service for the Whole Population", by Charles Byrne, 1943. Melbourne: Ramsay, Ware Publishing Proprietary, Limited. 8 $\frac{1}{2}$ x 5 $\frac{1}{2}$ ", pp. 146. Price: 6s.

The Medical Journal of Australia

SATURDAY, AUGUST 14, 1943.

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HOSPITAL ALMONERS AND THEIR WORK.

In a discussion on hospital almoners in this journal in December, 1937, the dogmatic statement was made that no large modern hospital is complete unless it has an almoner service. In 1937 the work of hospital almoners was gradually gaining recognition in the larger centres of the Commonwealth; progress has been made since then, the need for almoners is obvious, courses of instruction are in being and almoners are in training, but there is still room for expansion of the work. The war has in some places deprived hospitals of almoners and the time is ripe for reference to the whole subject, lest in the waging of war we lose a perspective that may not be easily recovered. The first reference to hospital almoners in these columns bears the date June 6, 1929. At that time plans were being laid in Melbourne to establish a scheme for the training of hospital almoners; a central council was being formed with representation of the Victorian Government, the Victorian Branch of the British Medical Association and other bodies; and a trained almoner was being selected in England that she might undertake the training of almoners at the Melbourne Hospital. In July, 1931, it was recorded in this journal that in a report to the Melbourne Hospital Committee the Medical Superintendent had commented favourably on the work of the almoner and had recommended the appointment of additional almoners. The first almoner in England was appointed at the Royal Free Hospital, London, in 1895. It thus took about thirty-five years before the English practice was adopted in Australia. If Australia was slow to follow the English lead, she fortunately proceeded with its development when once she had adopted the practice. But before the present stage of development is described, it will be useful to state once more the objects and scope of work carried out in an almoner's department.

The duties of an almoner were described in this journal in December, 1937, in the following quotation:

1. To ensure as far as possible that poverty, home difficulties or lack of understanding shall not prevent patients from receiving the full benefit of treatment prescribed.

2. To act as a link between the hospital and outside agencies, State or voluntary.

3. To acquire a knowledge of the patient's circumstances and home conditions, by visiting and detailed inquiry, for the use of the medical staff.

4. To organize the after-care of the patient on discharge.

5. If required to do so, to check abuse of the hospital by patients (a) who are in a position to pay for private treatment, (b) who do not require special hospital treatment, and (c) who can arrange for home treatment.

6. If required to do so, to assess and collect patients' contributions towards treatment and maintenance in hospital.

This statement of duties was amplified by the following statement:

Under these headings are included arrangements for supplying correct surgical appliances and for planning convalescence or holidays; for providing special diets; for raising financial assistance for patients in cooperation with outside agencies; for finding accommodation for country patients and destitute men and women attending in the out-patient department; for transport to and from the hospital; for institutional care and home treatment to free hospital beds for more urgent cases; for the constant watching and visiting of patients to prevent relapse and further hospital treatment, *et cetera*.

Clearly special qualifications are needed in those who wish to become hospital almoners—the work is not to be regarded as just another way of earning a living. The trainee must acquire some knowledge of hospital routine and must be sufficiently *au fait* with certain therapeutic measures and their significance to be able to discuss them intelligently with patients when need arises. She must also (this work is generally done by women) have an easy approach to people in all strata of society and be possessed of psychological insight. But over and above this there is one indispensable requirement—no woman can be a really successful almoner unless she has a certain love of humanity, a desire to help men and women just because they need help. The almoner is a liaison officer between hospital and patient and she helps directly both the hospital and the patient. If it were necessary to decide which assistance was the more valuable, the help given to the patient would be declared the more important because the work of an almoner may make all the difference between thorough and complete treatment on the one hand and a partial cure on the other. At the present time when hospital staffs are depleted, when medical practitioners are so overworked that it is difficult for them to follow the treatment of every patient as far as they would wish, and when patients themselves are apt to be affected by wartime rush and hurry, the work of almoners is more necessary than ever.

A statement on almoners' work in Australia was recently presented to the Parliamentary Joint Committee on Social Security on behalf of the Australian Association of Hospital Almoners by Miss Katherine Ogilvie, of Sydney. She discussed *inter alia* the almoner's contribution to efficiency in hospitals. Among the points on which she laid stress was the liaison which the almoner could establish between hospitals and other health services. She declared that cooperation between hospitals and other health and social services in the medical and social care of individuals could often prevent unnecessary use of hospital services, could

save patients from needless hardship and could produce more effective results than were possible if the hospital worked as an isolated unit. She pointed out that in Great Britain present conditions had created a greatly increased demand for almoners to undertake medico-social case work, and the Ministry of Health had advised that almoners should be appointed to all government hospitals to deal especially with medico-social problems arising from the war emergency. The Royal College of Physicians and the Ministry of Health had invited the cooperation of the English Institute of Hospital Almoners in planning post-war health services and curricula in social medicine in the medical schools. In regard to the United States of America, Miss Ogilvie stated that medical-social workers (this is the term used for almoners in that country) were established in all the principal hospitals; medical-social workers were also attached to many national and State health services and other health agencies. In many hospitals a medical-social worker was attached to each clinical unit. Approximately 2,000 medical-social workers were practising in the United States. It is also of interest to note that in the hospital standardization undertaken by the American College of Surgeons (see *THE MEDICAL JOURNAL OF AUSTRALIA*, May 12, 1923, page 536, and May 10, 1924, page 457) a department of medical-social work is now numbered among the minimum requirements of a first-grade hospital. The present state of almoner work in Australian hospitals was described by Miss Ogilvie. It appears that the Royal Melbourne Hospital now has five almoners at work. Six other Victorian hospitals have established almoner departments and almoners are also employed by the Victorian Society for Crippled Children and the Cancer Research Council. In Sydney eight public hospitals have departments employing from one to three almoners. Almoners have been employed at two hospitals in Perth, but since the outbreak of war it has not been possible to keep some of the posts filled. Since the war started about twenty almoners have been appointed by the Australian Red Cross Society to work as rehabilitation officers in military hospitals. Miss Ogilvie stated that requests by army medical officers for the services of rehabilitation officers are increasing and cannot be met from the present supply. The work of almoners in Australian hospitals differs in some respects from the type of work carried out in England and America. In this country it has not been thought desirable that the duties of an almoner shall include the assessment and collection of patients' contributions. In some hospitals, however, the head almoner has been asked to supervise and advise the assessing staff.

From our general discussion of the subject and from the evidence tendered on behalf of the Australian Association of Hospital Almoners to the Parliamentary Joint Committee on Social Security it is quite clear that the work of hospital almoners is not an activity that may be allowed to mark time because of the state of war. The Australian Association of Hospital Almoners recommended to the parliamentary committee that the Commonwealth Government should be asked to adopt the principle that all hospitals with one hundred or more beds should establish almoner departments and that almoners should be attached to health centres and to public health services which deal with medico-social problems. The Association of Almoners probably had in mind the creation of some kind of nation-

wide health service. If under present conditions the Commonwealth Government adopted the principle suggested, it would not be effective, since hospitals are controlled by authorities in the several States. The moral backing of a Commonwealth Government declaration would probably be valuable, but we should like to see the question taken up in individual States. The other recommendation made by the Association of Almoners is more important. It asks that the Commonwealth Government shall support the training of almoners and other social workers by declaring training for social work to be a reserved occupation, by making grants-in-aid to students, and by helping to develop the teaching of sociology and the social sciences in Australian universities. When the new Parliament is elected it may be possible to bring these matters to the notice of the appropriate minister or ministers.

Current Comment.

HYPERCHOLESTEROLÆMIA.

THE sterols may be said to have leaped into fame from obscurity in the course of a very few years. In Michael Foster's famous text-book of physiology there is a paragraph dealing with the metabolism of cholesterol, as it was then termed, phrased in beautiful English, but meaning absolutely nothing. Then came vitamin D, certain sex hormones, the carcinogenic factor in tar and a number of chemical allies operating on the heart either as poisons or as pharmacodynamic agents. A generation ago cholesterol was familiar to the surgeon as the chief component of gall-stones and as the material responsible for the spangles in old hydrocele fluid, and there it ended. Then with dramatic suddenness new vistas opened up with possibilities undreamt of. The sterol content of cellular tissues, of pathological degenerations and of the secretion of sebaceous glands has been determined again and again and the significance of the findings discussed. It was inevitable that the sterol content of circulating blood should be examined, particularly that of the plasma or serum, for the sterols present in the erythrocytes play probably a purely physical role and do not affect the tissues by way of the intermediary lymph. It must be confessed that some slipshod experimentation was carried out in much of this type of research, for quantitative assessments were based on colorimetric findings despite the fact that the pigmented body employed was unstable, whilst in the more reliable gravimetric method the sterols were lumped together as unsaponifiable ether extract. This may be the explanation why so many discordant results were announced and so many changes of opinion expressed; another being that correlations were sought where none existed. As an example of altered viewpoint it may be mentioned that Joslin in 1928 fixed a limit for hypercholesterolemia in diabetes above which danger existed, whereas in 1937¹ the flag of distress was flown by him when hypocholesterolemia was taken as the predicting barometer at a certain low level. In one important tissue, namely, cardiac muscle, sterols are abundant, but physiologists who have based their hypotheses of contractility on physics rather than chemistry pay little heed to this factor. We may be certain that the rich endowment of sterols in the heart has a function, but no suggestion what that function may be has yet been presented.

An important contribution to the subject of cholesterol in blood comes from the Department of Medicine in the University of Sydney and from Sydney Hospital. In his thesis "The Blood Cholesterol Content in Myxœdema and other Conditions" published in book form by the

¹ E. P. Joslin: "The Treatment of Diabetes Mellitus", Sixth Edition, 1937, page 135.

Australasian Medical Publishing Company, Limited, Dr. E. H. Stokes gives the results of a long and painstaking inquiry, both clinical and experimental.¹ In diabetes the hypercholesterolemia is probably one feature only in the general disturbance of metabolism of the ether-soluble bodies. It has long been known that excision of the pancreas in the dog produces not only an orthodox diabetes, but an intense lipemia in which the blood actually creams on standing. Cholesterol, like lecithin, with which it is so often associated, though chemically unallied, shares in the excess of lipide matter in the blood in this condition. But why should myxedema display augmented cholesterol in the blood plasma? This is the main problem which Dr. Stokes has attacked. When myxedema sets in the blood, cholesterol rises; when under thyroid medication the myxedematous condition ameliorates, the cholesterol percentage falls; there is apparently a parallelism between the amount of cholesterol and the gravity of the myxedematous state. To help in elucidating this problem Dr. Stokes put the thyroid out of action by surgical excision, by irradiation and by implanting radon seeds. In neither rabbit nor monkey did a myxedematous state ensue. This negative result others have recorded and there is little doubt that Victor Horsley in his claim to have produced myxedema by removal of the thyroid allowed his enthusiasm to get the better of his judgement, as occurred also in his work on experimental scurvy. There is something more in myxedema than a deficiency of thyroxin, and this something Dr. Stokes regards as the possible causative agent in the hypercholesterolemia, even though, as stated, thyroid medication brings the blood cholesterol to normal limits.

In xanthomatosis where lipoids are deposited in the tissues a rise in blood cholesterol was frequently found, but not always. The same may be said of Bright's disease where elevation of the cholesterol level in blood, when it does occur, is unaffected by thyroid treatment. Dr. Stokes has also estimated the cholesterol in serum in a wide range of pathological conditions, but without discovering any obvious correlation. Such negative findings are often disappointing to the researcher, but they are none the less valuable. His cautiously expressed summary can be commended for its scientific restraint. Two minor suggestions may be offered for Dr. Stokes's consideration. His method of estimating serum cholesterol was that of Myers and Wardell modified by Ling.² A critical examination of the accuracy of this technique would not have been amiss. The second is that ultra-microscopic investigation of the serum could well have been undertaken. However, Dr. Stokes has carried out a very thorough piece of work which is certain to be stimulating to others in the domain of experimental medicine.

SPHYGMOTONOGRAPHY.

THE arterial blood pressure is a prolific field for physiological research as well as being a clinical feature of importance in medical practice. Numerous studies of the blood pressure have been made; but they have been hampered somewhat by the difficulty of obtaining continuous records. Such records have been obtained from laboratory animals; but their interpretation cannot be regarded as applicable in all respects to man. Apart from the experimental aspect, there are times when continuous blood-pressure readings are desirable from a purely clinical point of view. A noteworthy example is provided by prolonged general anaesthesia. Some years ago Kurt Lange devised an apparatus that was capable of recording the systolic pressure or the diastolic pressure graphically on a moving paper; he has recently published some of the results of his experiments with his apparatus, which he

calls a sphygmotonograph.³ The main features of the sphygmotonograph are as follows. An air pump or a chamber containing compressed air is connected by rubber tubing to one of two cuffs similar to an ordinary sphygmomanometer cuff; the supply of air is controlled by an electrically operated valve; the two cuffs communicate with each other by a narrow opening; the second cuff communicates with a nozzle, through which puffs of air are blown by the brachial pulse and operate an electrical instrument, which opens or closes the valve controlling the supply of air to the first or upper cuff. Recording instruments communicate with the tubing connecting the pump and the upper cuff. When the apparatus is set for recording the diastolic pressure the valve is open. Immediately the first sharp pulsation is transmitted to the air in the tightening lower cuff, a puff of air is ejected from the nozzle and sets up an electrical impulse, which closes the valve. So long as the pulsation continues to be transmitted through the cuff, so long will the valve remain closed. The instrument records the pressure, and this is read as the diastolic pressure. When the apparatus is set for recording the systolic pressure, the valve is closed. The valve opens when the brachial pulse is transmitted through the compressed air in the cuff; it closes as soon as the brachial pulse is obliterated. At this point the systolic pressure is recorded. This is merely a sketchy outline of the instrument and its mode of operation; readers are referred to Lange's article for a detailed description.

Lange has proved the accuracy of the sphygmotonograph records by comparing readings made within a minute or so by the auscultatory method. He has also made simultaneous tracings from both arms of a patient and has found the two to be identical. It might be suggested that prolonged application of a tight cuff to a limb, causing partial arrest of circulation, would have a detrimental effect on nerves, vessels or muscles. In this regard, Lange points out that Lewis has shown that even total arrest of the circulation in the arm for as long as half an hour causes no permanent damage. Furthermore, many thousands of patients have been treated by Bier's method of inducing hyperemia without damage. Lange points out also that the shortest reported period required for the appearance of Volkmann's contracture is five hours, the circulation having been totally arrested and the artery directly injured. Lange has taken continuous records over a period of thirty minutes on many occasions without deleterious effect. After about ten minutes, "numbness and a certain tickling sensation appear in the fingers, which some patients call uncomfortable, whereas others are not much disturbed by it". In three of the 400 odd cases investigated by Lange the examination had to be stopped after two minutes because of the appearance of petechial bleeding in the skin of the arm. The three patients had recently recovered from an infectious disease.

It was thought that the discomfort experienced by the patient during the examination might have an effect on the blood pressure. To test this, Lange made tracings from ten patients in a quiet ward, where no added psychical disturbance was likely to influence the course of the experiment. In no instance did he find a variation of more than five millimetres of mercury during a period of fifteen minutes. A further possible objection is that stagnation of venous blood in the limb might so far decrease the volume of the circulating blood as to cause a fall in blood pressure. Lange has found that no such fall occurs.

Among interesting results of Lange's experiments are the appearance of Traube-Hering waves, between fifteen and thirty seconds in duration and four to twelve millimetres in height, on tracings obtained from normal persons, and their obliteration by the administration of morphine. He also shows graphically the influence of excitement on both the systolic and the diastolic pressure. He shows that the increase in pressure from psychical causes is more pronounced in the early stages of hypertension.

The wealth of knowledge that might come from the application of this apparatus to various fields of clinical and physiological research is boundless.

³ *Annals of Internal Medicine*, March, 1943.

¹ E. H. Stokes: "A Clinical and Experimental Investigation of the Blood Cholesterol Content in Myxedema and other Conditions", by E. H. Stokes, M.B., Ch.M., F.R.A.C.P., 1941. Sydney: Australasian Medical Publishing Company, Limited. 94" x 7½", pp. 120, with 13 figures.

² S. M. Ling: "The Determination of Cholesterol in Small Amounts of Blood", *The Journal of Biological Chemistry*, Volume LXXVI, 1928, page 361.

Abstracts from Medical Literature.

PÆDIATRICS.

An Epidemic of Rheumatic Fever among Children.

SOL P. DITKOWSKY, EDWARD STEVENSON AND JOSEPH M. CAMPBELL (*The Journal of the American Medical Association*, March 27, 1943) discuss an epidemic of rheumatic fever in a children's school, which followed an outbreak of acute tonsillitis. For the purpose of study the patients admitted to hospital with a diagnosis of rheumatic fever were divided into three groups: (i) those with severe polyarthritis associated with fever and rapid sedimentation rates, accompanied in some instances by rheumatic erythema, nodules and carditis; (ii) those with moderate or subacute polyarthritis associated in some instances with rheumatic erythema, nodules and carditis; (iii) a group of younger children with cardiac manifestations associated with continued fever, elevated sedimentation rates, rapid pulse, epistaxis, leg aches, abdominal pain and pallor. The conclusions reached by the authors after studying various features of the epidemic are: (i) The epidemiology of rheumatic fever is closely linked with that of streptococcal infections of the upper respiratory tract. (ii) Familial predisposition on the basis of the susceptibility of specific tissue is probably an important factor in the pathogenesis of rheumatic fever. (iii) The most susceptible age group appeared to be between nine and fourteen years; sex did not appear to be a factor. (iv) Sixty-two children (65%) had histories compatible with previous rheumatic infections. Sixty-one children had systolic apical murmurs which were elicited before the present rheumatic attack; most of the murmurs had the characteristics of functional murmurs. This would suggest that murmurs should be studied repeatedly before they are dismissed as insignificant. (v) No direct correlation could be made between meteorological conditions and the incidence of rheumatic fever; it was thought that they were important only in so far as they were related to the seasonal incidence of infections of the upper respiratory tract.

Conditions Causing Confusion in the Diagnosis of Rheumatic Fever in Children.

ARILD E. HANSEN (*The Journal of the American Medical Association*, March 27, 1943), in an attempt to determine which disorders in children tend to be confused diagnostically with rheumatic fever, makes a study of the diagnoses given by medical practitioners and resident staff members with regard to 271 children suffering from rheumatic fever, who were admitted from 1928 to 1941 to the in-patient and out-patient cardiac disease clinic of the Department of Pediatrics of the University of Minnesota. The writer states that in two-thirds of the cases there was essential agreement in diagnosis, and that a review of the records of the remaining cases revealed that the conditions causing most difficulty in the diagnosis of rheumatic fever were as

follows: (i) abdominal pain with possible appendicitis (about one-fourth of the cases studied); (ii) acute anterior poliomyelitis; (iii) acute osteomyelitis; (iv) erythematous or purpuric skin eruptions; (v) evidences of acute nephritis; (vi) acute fulminating illnesses (sepsis, pneumonia, subacute bacterial endocarditis); (vii) low-grade infections; (viii) nervousness in mild minor chorea. The writer holds that, in view of the fact that rheumatic infections may involve so many tissues and vary to such a great extent in intensity, it is rather surprising that the list he has given was not longer. He concludes that the physician who is called on to care for children should be thoroughly familiar with the various and diverse manifestations of rheumatic fever.

Petrolatum as a Medicament for Children.

JOHN LABORSKY (*Archives of Pediatrics*, May, 1943) states that evidence that petrolatum administered internally may be detrimental to the physiological functions of the body and cause chronic pathological changes in the tissues is increasing. For several years he has frowned upon the continued use of liquid petrolatum as a laxative. The retardation in growth was striking in a few cases and an increasing abdominal enlargement was discovered sometimes. Symptoms of a chronic colitis were apparent in a few cases. Furthermore, the author is of opinion that the prolonged ingestion of mineral oil may be a factor in the causation of so-called idiopathic chronic ulcerative colitis. He gives a brief report of three patients with this condition. Each gave a history of the administration of mineral oil for constipation almost every day for several years. Even on the skin annoying inflammatory reactions may occur from the application of petrolatum, especially in young infants. For some time the author has had the impression that the official oxide of zinc ointment does not possess the healing properties that were ascribed to it twenty years ago. He attributes this observation to the fact that formerly benzoated lard was used as a base, but soft petrolatum was substituted in recent revisions of the U.S. Pharmacopoeia. Finally, it is now well known that liquid petrolatum when aspirated into the lung from the nasal passages produces a singular form of chronic inflammation known as lipid pneumonia. For these various reasons the author considers that it seems wise for pediatricians to discard this substance almost completely from their armamentarium.

Tumours of the Brain in Children and Adolescents.

JOSEPH H. GLOBUS, LIEUTENANT JOSEPH M. LUCKER AND JOSEPH M. RUBINSTEIN (*American Journal of Diseases of Children*, April, 1943) have surveyed clinically and anatomically ninety-five verified cases of tumour of the brain encountered in children and adolescents. While on the whole expanding intracranial lesions in persons of these age groups (from infancy to sixteen years of age) behave clinically in a way similar to those occurring in older persons, they exhibit some clinical departures which deserve attention. Among these deviations is the frequent absence of papilloedema associated with

tumours localized in the pons, a situation which causes severe internal hydrocephalus and hence should be a more common cause of choked disks. There is also the greater incidence of manifestations of vegetative dysfunctioning expressed in retarded or accelerated development of secondary sex characters. These manifestations are, of course, readily explained by the greater incidence in children of suprasellar tumour (craniopharyngioma) which by direct pressure causes anatomical and hence physiological disturbance in the tuber cinereum, the seat of the centres controlling vegetative activity. The same holds true of pinealoma which exercises its influences on the hypothalamus indirectly by blocking the iter, and thus causes hydrocephalus, which in turn causes excessive thinning, stretching and disruption of the flow of the third ventricle, including the tuber cinereum. In line with the foregoing manifestations is the occasional symptom of abdominal distress or obstipation, both conditions being probably central in origin. Another striking feature is the low incidence of tumours in children between the ages of six and ten years. As to the type of tumour prevalent in children and adolescents, it seems that the autochthonous blastomatous tumours predominate, an observation which supports the view that cerebral neoplasms in the majority of instances probably originate from embryonic rests. The best examples of such tumours are craniopharyngioma, pinealoma, ependymoma and hamangioblastoma. Trauma to the head, although recorded in a few cases as marking the onset of symptoms of intracranial involvement, is found to be of no significance as a precipitating or accentuating cause of growth of the tumour. The value of X-ray therapy cannot be estimated with any degree of accuracy on the basis of the small number of cases available for this study in which this treatment was used, but there is evidence that it deserves further trial and study.

Hæmophilus influenzae Meningitis in an Infant Treated with Sulphathiazole.

DUNCAN LETS (*British Journal of Children's Diseases*, March, 1943) reports the complete recovery of an infant, aged ten months, from *Hæmophilus influenzae* meningitis. There were no obvious sequelæ. Twenty-four grammes of sulphonamide (all as sulphathiazole except for eight grammes as sulphadiazine and five grammes as sulphamethazine) were given during the course of seven weeks, two relapses occurring when it was discontinued. Sodium sulphathiazole (1% solution) was also used intrathecally. The lowest recorded number of granular cells in the blood was six hundred per cubic millimetre. Pent-nucleotide was given in repeated doses of two cubic centimetres when the polymorphonuclear cell count fell below 2,000 per cubic millimetre, and an attempt was made to prevent marrow depression by giving injections of liver throughout the illness. Other treatment consisted of the regular oral administration of iron, ascorbic acid, vitamins A, D and P and injections of vitamin B₁. Chloral was used freely to control excitement and great efforts were made to maintain fluid intake at its maximum throughout the illness. A

rectal drip was used effectively when vomiting was present. A sufficient caloric intake was assured by using a rather concentrated dried milk mixture with a high percentage of dextrin and corn syrup.

Newer Concepts in the Treatment of Meningococcus Meningitis.

MARION L. BLUMBERG AND MORRIS GLEICH (*Archives of Pediatrics*, April, 1943) give case reports which exemplify the new methods in the treatment of meningococcus meningitis. They point out that this condition is a systemic infection with localization in the central nervous system. The symptom of persistent vomiting tends to produce dehydration and ketosis. Thus the therapy has two aspects. The intravenous administration of 5% glucose in normal saline solution offsets the ketosis by supplying fluid and electrolyte, while the sulphonamide has a bacteriostatic effect on the meningococci. The intravenous treatment is continued for twenty-four to thirty-six hours. The volume of infusion given varies from 30 to 60 cubic centimetres per pound of body weight per day, accompanied by oral fluids as tolerated. One to one and a half grains of sodium sulphadiazine per pound of body weight per day are given intravenously. The initial dose is one-third to one-half of the total daily dose. This is followed by one-sixth of the total daily dose every four hours. The same dosage of sulphadiazine is given orally after the intravenous route is discontinued until the patient's fever and abnormal signs and symptoms have been absent for a week. The drug is then gradually tapered off and discontinued. Examination of the urine, blood counts and estimation of the blood sulphadiazine level serve as guides in the course of the disease and the therapy. One lumbar puncture is preferred for diagnosis only. A second lumbar puncture is occasionally necessary for the relief of severe headache due to increased intracranial pressure.

ORTHOPÆDIC SURGERY.

Osteogenetic Grafts in Tuberculosis of the Hip Joint in Childhood.

E. D. TELFORD AND J. E. GEDDES (*The British Journal of Surgery*, January, 1943) discuss the treatment of tuberculosis of the hip joint in childhood. They hold that in the present state of knowledge the best result that can be hoped for from any form of treatment is solid, bony fusion in the optimum position. Conservative treatment alone does not often bring this about, and for this reason bone grafting is extensively used. The methods of grafting are divided into two groups: (i) the fixative graft and (ii) the osteogenetic graft. The fixative graft is no more than an internal splint and is apt to fracture or to fail in union at one or other end. The osteogenetic graft has been used less frequently during the last ten years than the fixative graft, possibly owing to fear of opening a diseased joint; the authors consider that fear unfounded. The osteogenetic graft should be used only in a joint that is already quiescent and on its way to repair; it acts purely as a stimulus to osteogenesis. The authors believe that the osteogenesis is due to the action of fresh osteoblasts acting

on granulation tissue which is stagnant and unable of itself to make bone. They hope that in the future it may be possible to ask the tissue-culture laboratory to provide osteoblasts for injection into the joint, and so to avoid open operation. The operation should not be undertaken until radiological evidence of arrest of the disease and commencing repair is obtained. It should not be used for very young children; the age of eight or possibly ten years is early enough. The presence of a closed abscess is not a contraindication; such abscesses can usually be dealt with easily, and this should be done some time before the operation on the hip. The authors have operated in the presence of a sinus that had been well healed for three months. Any evidence of recent tuberculous activity in the lungs is a contraindication. Between the years 1932 and 1940 the authors have performed this operation on 26 children, aged from six to eighteen years; excellent results were obtained in 19 cases, and in the remaining seven firm bony union was not secured. However, the seven patients classed as "failures" are all well and active. The authors believe that the causes of failure were as follows: (i) in two instances the patients were too young (aged six and seven years); (ii) in four cases the authors' view of the radiological evidence of repair seems to have been too optimistic; (iii) in the remaining instance a pulmonary focus became reactivated at intervals. A description of the technique of the operation is given.

Gas Gangrene Treated by X Rays.

K. D. McMILAN (*Western Journal of Surgery, Obstetrics and Gynecology*, May, 1943) discusses the X-ray treatment of gas gangrene. He bases his study on all the cases in the literature available to him, and on thirteen cases occurring in the State of Oregon. The chief points in the diagnosis are as follows: (i) pain (the most common symptom); (ii) swelling (the most common sign); (iii) increased pulse rate; (iv) bacteriological findings; (v) discoloration of the tissues; (vi) crepitus in the tissues and gas in the exudate; (vii) bad odour; (viii) elevation of temperature; (ix) the presence of gas detected in the skiagram (one of the most constant and accurate of diagnostic signs). The author calls attention to Rhinehart's method of distinguishing between gas in the tissues due to gas-forming organisms and gas introduced at the time of injury. Frequent skiagrams should be taken; these will show early absorption or constancy in amount of the latter, and rapid increase and spread in the case of the former. Gas gangrene should be considered a possible complication in compound fractures, wounds contaminated with soil, extensive lacerations or crushing wounds, and occasionally after abdominal operations. When gas gangrene is likely to develop, skiagrams of the involved area should be taken every four to six hours. Prophylactic treatment of wounds likely to be affected by gas gangrene should be along the following lines: (i) immediate débridement, (ii) use of sulphanilamide in the wound, (iii) adequate doses of tetanus gas-gangrene antitoxin; (iv) irradiation with X rays. Active treatment should be as follows: (i) 100 r of X rays applied over the involved areas as soon as the diagnosis

is made, or gas gangrene infection is strongly suspected; this treatment is repeated twice a day for three days, or until the infection is controlled; (ii) local débridement; (iii) the administration of therapeutic amounts of the antiserum if the infection is more than twelve hours old, or if the patient does not respond to the other treatment. Amputation for gas gangrene *per se* should not be performed. Of the 450 cases studied, X-ray therapy was used in 416; 62 deaths occurred. This represents a reduction of some 34% in mortality rate with the use of X rays.

Rehabilitation after Meniscectomy.

J. J. R. DUTHIE AND J. G. MACLEOD (*The Lancet*, February 13, 1943) discuss the results obtained at an army convalescent depot in the rehabilitation of 186 patients after meniscectomy. Each patient was carefully examined by one of the writers on admission to the depot, and it was found that the condition of the knee joint at this initial examination varied considerably. In 140 patients there was obvious wasting of the quadriceps; 94 had some limitation of flexion at the knee joint; an effusion was present in 63 cases, and there was laxity of the cruciate ligaments in 45. All patients were treated by a graded course of intensive quadriceps exercise. In general, each man had daily two periods of remedial exercise, one period of physical training followed by a swim, one period of therapeutic games, and one period of education. The tables of remedial exercises were largely concerned with quadriceps exercises, in which initially non-weight-bearing was allowed. It was repeatedly emphasized that static quadriceps contractions should be carried out in the man's own time for at least five minutes in every hour. Among the remedial exercises were those of the weight-and-pulley type. There were four grades of general physical training ranging from the lowest, in which the training was carried out seated, to the highest, which included cross-country running and a 15-mile route march. The writers have found the latter an invaluable aid in the later stages in assessing whether a knee is "100% sound". The average duration of treatment was 35 days, and the average total time off duty was 82 days from the date of meniscectomy. Over 80% of the men were considered fit to return to immediate full duty. The authors state that about 60% of the cases dated from a football injury and that almost half the total number of patients had been in hospital for knee trouble before. A plea is therefore made for the earlier recognition of cartilage injuries. To assess the relative merits of resisted exercises and unresisted exercises in the treatment of wasted quadriceps after meniscectomy, an experiment was carried out. The men were divided into two groups. Those in Group I were treated by resisted exercises—raising a weight suspended over a pulley. Those in Group II carried out a table of remedial exercises containing no resisted exercises. The writers conclude that resisted exercises in the form of weight-lifting restore strength to the quadriceps more rapidly than non-resisted exercises, and they hold that resisted exercises should form a part, if not the whole, of the treatment of patients with wasted quadriceps after meniscectomy.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Carlton, Melbourne, on May 12, 1943, Dr. H. D. STEPHENS, the Acting President, in the chair.

Chronic Ulcerative Colitis with Indolent Skin Lesions.

DR. LENA THOMAS showed a female child, aged eleven years and four months. This patient had had recurrent attacks of colitis associated with ulcerative skin lesions for the last five or six years. These had steadily increased in severity and duration. There was no definite history of the first attack; but the early history was of recurrent acute colicky abdominal pain associated with diarrhoea and the passage of blood and pus in the feces, and preceded by crops of impetiginous sores. After two years, Meckel's diverticulitis was suspected and laparotomy was performed, after a barium meal examination and sigmoidoscopy had revealed no abnormality. No abnormality was seen at operation. The symptoms recurred a few months later, and various investigations were carried out early in 1940. X-ray examination after a barium enema revealed no abnormality. The feces contained pus, but no amœbæ, and lactose fermenters only were found on culture. A test meal examination revealed almost complete achlorhydria. The patient was given a course of emetine treatment, and the attack subsided. Late in 1940 another attack occurred, and a sigmoidoscopic examination at this stage revealed numerous bleeding points in the colon. The patient's condition improved with treatment by a non-residual diet with extra vitamins and "Normocol", and the use of acriflavine enemata. A month later she developed skin lesions, diagnosed as impetigo, over the limbs, face and scalp. These took two months to heal. Her temperature was elevated at that time. Four months later she had her most severe attack of colitis; it was associated with deeply excavated ulcers of the legs, buttocks and arms, the largest being three inches in diameter. Culture produced a growth of *Staphylococcus aureus*. Her hemoglobin value was 30%, and a blood transfusion was given. Her temperature was of the remittent type and remained elevated for two months. The bowels were opened two to six times per day, and the stools contained blood and pus. A course of staphylococcal toxoid was given with gradual improvement in the skin and bowel condition. In November, 1942, she was admitted to hospital with a history of painful subcutaneous lumps on the thighs, trunk and arms, associated with a temperature of 100° F. to 103° F., of three weeks' duration. The lumps were neither hot nor red, and they subsided under treatment with plastines and sulphanilamide. In December, 1942, X-ray examination after a barium enema revealed that the rectum and pelvi-rectal junction were narrowed, and that the colon had lost sacculations. In January, 1943, fluctuant subcutaneous lumps developed over the sternum, over the right tibia and in the calf of the right leg, and two months prior to the meeting in the right hand. Thick pus was obtained by aspiration. The lesions over the sternum and tibia broke down, leaving discharging ulcers with thickened, rolled edges and granulating bases. The lump in the calf subsided. Microscopic examination disclosed no organisms in the pus. Attempted culture of *Mycobacterium tuberculosis* and anaerobes on ordinary media was unsuccessful. A slowly growing diphtheroid was obtained on one occasion. The blood was sterile and failed to react to the Wassermann test. There was no response to the Mantoux test. The temperature remained elevated for about one month. A blood examination showed the hemoglobin value to be 45%. The leucocytes numbered 12,500 per cubic millimetre. A blood transfusion was given. Biopsy of an ulcer showed a non-specific chronic inflammatory state. Each new skin lesion was associated with a "swinging" temperature and an exacerbation of the colitis. A sigmoidoscopic examination in April, 1943, revealed gross ulceration of the rectum and colon. No stricture was present.

Dr. Thomas said that the problem was one of both diagnosis and treatment. There might be a common basis for the skin and bowel lesions, such as a vitamin deficiency, which predisposed the patient to secondary infection; or there might be lack of absorption of food and vitamins, so that the resistance of other tissues was lowered. That a general bowel disturbance was present was indicated by the lack of hydrochloric acid in the stomach. Alternatively, the abscesses might be metastatic from the infected bowel. The

colitis had steadily progressed for the past four years in spite of medical treatment. Dr. Thomas asked whether surgical treatment, such as the establishment of an ileostomy designed to rest the colon, with perhaps the performance of colectomy later, was indicated.

DR. BRUCE HALLOWS said that he had performed sigmoidoscopy. The sigmoidoscope easily passed to fifteen centimetres. He was struck by the extreme destruction of mucous membrane, hæmorrhage and pus formation. If the remainder of the colon was as badly involved, one could not expect much from medical treatment. Indeed, six years' treatment on medical lines had produced poor results. With regard to surgical treatment, one had to consider appendicostomy or ileostomy and colectomy. In his experience, appendicostomy was not altogether satisfactory. Ileostomy was more successful in resting the colon. If this measure proved insufficient, one might reluctantly be brought to perform colectomy.

DR. H. BOYD GRAHAM wondered if death were not preferable to such an existence as fell to the lot of this unfortunate child. Relapses and remissions could be expected over a period of years, and the chief calamity seemed to be that such patients would not die. Surgical washing over the bowel surface sometimes avoided the necessity for colectomy. Serum treatment, or sulphanilamide therapy, or the two in combination, seemed indicated. Such cases called for the combined skill of physician and surgeon acting in close liaison. Improvement for a few years could be expected; but the remote prognosis was bad.

DR. ROBERT SOUTHBY said that the skin lesions were most unusual; they were severe and obstinate. This gave him the impression that they were independent of the colitis. The "tissue paper" scars suggested a possible syphilitic origin. In spite of the failure of the blood to react to the Wassermann test, he favoured a trial of anti-specific treatment and close observation of the effect. The absence of hydrochloric acid revealed by the analysis of the gastric contents indicated replacement therapy. The colitic condition was notoriously obstinate. Parke, Davis's chronic ulcerative colitis anti-streptococcal serum, prepared under the direction of Bergen, might help. Dr. Southby recalled dramatic improvement in the case of one patient under his care when he was given this serum. A relapse responded to a further course of serum in this case. Later, the same patient developed acute appendicitis, but no colitic relapse followed. The patient was at the time of the meeting taking a full diet and passed normal stools. Dr. Southby said that he had read an article describing a small series of cases in adults, in which the condition was treated by pneumoperitoneum. A considerable amount of benefit lasting for two or three years had been obtained.

DR. W. W. McLAREN congratulated Dr. Thomas on the way she had marshalled her facts, and also paid tribute to the nurses in the patient's ward. He said he had never seen a more difficult patient to nurse. The skin lesions were an interesting accompaniment to the colitis. They were unique in his experience. Whether they were independent of or secondary to the bowel condition was difficult to say. He had noticed that there was always a flare-up in the bowel condition before a relapse of the skin lesions appeared, and therefore they were probably related. Two types of skin lesions were noticed: cutaneous necrosis and subcutaneous abscesses. All possible measures had been tried, including the administration of hydrochloric acid and the exhibition of sulphonamide. A search had been made for Bergen's streptococcus, but without avail. If the skin lesions were secondary, there seemed to be justification for the establishment of an ileostomy.

DR. J. W. GRIEVE said that he had had limited experience with chronic ulcerative colitis, but he had been able to follow some patients for years. He was impressed by the fact that most patients had periods during which they were remarkably well. He remembered one girl who still passed three or four stools per day which contained a little blood, but who was otherwise well and maintained her school attendances. On one occasion when she had acute tonsillitis, a sigmoidoscopic examination revealed follicular ulceration of the colon. With regard to treatment, one was well advised to watch the hemoglobin percentage and consider blood transfusion when it fell below 70. Local bowel treatment and the taking of a high caloric diet were necessary. Periods of rest were essential. However, such patients were disappointing to handle, and since they relapsed at intervals, Dr. Grieve could not recall recovery taking place; but many patients went along in comparatively good health for many years. At the present time most of the surgeons were afraid of them.

Dr. H. D. SEPHENS said that he thought that ultimately cure would rest with the physicians. He had never seen benefit follow caecostomy. He remembered a boy who was given all treatment available, including Bagen's vaccine, and whose weight remained stationary for three months. However, when he was sent home he gained four pounds in two months. In Dr. Stephens's experience, surgical treatment had not been satisfactory.

Dr. Thomas, in reply, said that other investigations had not confirmed the work of Bagen. Professor MacCallum had been able to isolate the organism from the faeces of normal people. The vaccine, however, did seem to have a non-specific value. Surgical treatment appeared indicated in such cases if polyposis or other severe organic lesions were also present. Ileostomy and later colectomy appeared to be the best measures. In studying the literature, Dr. Thomas had come across twenty cases of colitis associated with skin lesions. The latter varied from *erythema nodosum* to deep ulceration and subcutaneous abscesses. In one pus was present, and *Staphylococcus albus* was cultured from it; this case paralleled her own in many respects. Apparently there existed a deficiency factor for both bowel and skin predisposing them to infection and preventing absorption of vitamins. In such cases parenteral vitamin therapy was indicated. In some cases similar organisms were obtained from the bowel and the skin ulcers. These may have been metastatic.

(To be continued.)

Post-Graduate Work.

LECTURES IN SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that the programme of the course of lectures that are being delivered at 4.30 each Monday afternoon at the Stawell Hall, 145, Macquarie Street, Sydney, is as follows:

Monday, August 16: "The Present Position of the Vitamins", Professor H. Priestley.

Monday, August 23: "The Management of Established Wound Infection", Dr. H. R. G. Poate; "Kationic Chemotherapy with Special Reference to Acridines", Dr. Adrien Albert.

Monday, August 30: "Surgery of Peptic Ulcer", Dr. B. T. Edye; "Some Observations on Gall-Stones", Dr. T. M. Furber.

Monday, September 6: "Preparation and After Care", Dr. J. C. Storey; "Chest Surgery", Dr. M. Susman.

Monday, September 13: "Injuries of the Small Intestine and its Mesentery", Dr. E. Fisher; "Intestinal Intubation in the After Treatment of Abdominal Operations", Dr. V. M. Coppleson.

Monday, September 20: "Common Disabilities Affecting the Shoulder Region", Dr. D. J. Glissan; "Foot Disabilities", Dr. J. Hoets.

Monday, September 27: "Carcinoma of the Prostate", Dr. R. Bridge; "The Modern Management of Prostatic Obstruction", Dr. R. J. Silverton.

The fee for attendance at this course of lectures is one and a half guineas for twelve lectures, or half a guinea for a series of four lectures. Medical officers of the Australian and allied forces are invited to attend free of charge. Those wishing to attend should make application to the Secretary of the Committee, 145, Macquarie Street, Sydney.

Correspondence.

AMOEBIIC DYSENTERY IN THE NORTHERN TERRITORY.

SIR: In the issue of THE MEDICAL JOURNAL OF AUSTRALIA for July 24, the report of Major Kay and Captain Johnston of seven cases of amoebic dysentery in the Northern Territory is of considerable interest, but no references to any previous records, coupled with the sentence "Amoebiasis may feature . . . and a history of not being outside Australia will not

exclude this condition, as it might have done previously", may create the impression that *Entamoeba histolytica* and amoebic dysentery are unknown here. To correct this possible impression I am sending a few references.

Johnston, T. Harvey (1909), *Rec. Aust. Museum*, Vol. VII, p. 330, Records of Several Cases of Amoebic Dysentery and Amoebic Abscess in Australia.

Maplestone, P. A. (1921), *Ann. Trop. Med. and Parasitol.*, Vol. XIV, p. 283, Records of 4.6 per cent. of Carriers in a Single Examination of 500 Stools in North Queensland.

Baldwin, A. H., Heydon, G. M., and Broben, J. A. (1927), *Med. J. Australia*, 14th Year, Vol. I, p. 374, A Report of One and Possibly a Second Case of Amoebic Dysentery Acquired in Australia.

There may be later references than these, but they should be sufficient to indicate that not being outside Australia has been insufficient to exclude the possibility of this infection for a great many years.

Yours, etc.,

PHILIP A. MAPLESTONE.

Lachlan Park Hospital,
New Norfolk,
Tasmania.
July 28, 1943.

THE TREATMENT OF ANGINA PECTORIS BY TESTOSTERONE PROPIONATE.

SIR: May I through your valuable lines extend thanks to Dr. Bruce T. Shallard for his letter printed in the issue of July 10 and respectfully offer some results of an experience in the use of this form of therapy in *angina pectoris*?

I was interested to read that Master and Oppenheimer's test was to be used as a control. Might I recall that angina, particularly that due to coronary disease, varies from day to day even in the absence of any treatment? I believe improvement is best gauged by the patients themselves who realize better the improvement in the alteration of the level of threshold for pain excited either by effort or emotion. Twenty-five milligramme doses in some cases brought an uncomfortable effect in the first forty-eight hours and patients were disinclined to persevere. Ten milligramme doses were better tolerated with favourable results. A retired pharmacist, eighty-one years of age, suffered frequent *angina pectoris* attacks; able to walk only a few yards before the onset of pain, a constriction to the throat, thence down the left arm, and sometimes the right arm, brought on by excitement, walking, and particularly after food (breakfast), with palpitation and shortness of breath during attacks; had a seven years' history of angina following coronary thrombosis; usually ingested two or three tablets (trinitrin, one two-hundredth of a grain) daily. He experienced more susceptibility to pain after the twenty-five milligramme dose of "Neohombreol" and was placed on ten milligramme intramuscular injections, eleven being given. Recently "checked up" thirteen weeks after last injection, he felt well, no morning pain for over three months, can walk three or four blocks at an easy, steady pace; no trinitrin tablets for five or six weeks; and for the first time for seven years has dispensed (for three periods of fourteen days each) can do a little gardening without distress.

Oral administration of methyl-testosterone is, I believe, uneconomical, as the effects of ten milligrammes thrice weekly can quite well be maintained by one intramuscular injection of five milligrammes weekly. The wrong inference might be drawn also by those who wish to try this form of therapy from the quotations given by Dr. Shallard. In the splendid review given in *The New England Journal of Medicine*, Volume CCXXVIII, Number 11, of March 18, 1943, by Aub and Kety of their "Recent Advances in Testosterone Therapy" they clearly state: "There is as yet no evidence of permanent harm resulting from its moderate and clearly indicated usage."

Yours, etc.,

LEON OPIT.

21, King William Street,
Adelaide,
July 26, 1943.

A STRANGE EXPERIENCE.

SIR: I have had an extraordinary psychological experience, none other than a visitation from and conversation with a deceased member of what was our profession.

As I do not propose to sign my name, I can without embarrassment give you some of the previous history of myself which will make the story even more extraordinary.

I some few years ago finished a brilliant course with honours in clinical medicine and later got my M.D. for a lengthy thesis on pathological diagnosis, checked by results of 1,000 autopsies. I then took some old-fashioned rooms in Collins Street, which for seventy years had been used as consulting rooms—and being considered more than usually competent I have had a number of patients sent to me by my fellow students.

I had finished an extra busy day of case-taking and reports and must, I conclude, have fallen asleep from sheer fatigue.

Imagine my surprise on seeing the door slowly open and an old gentleman in frock coat and side whiskers, with a silk hat and gold headed stick on his arm, enter the room.

I looked up in surprise, but before I could speak he said:

"Excuse me, sir, I did not expect to see you here, but I came to see once again the old rooms I worked in for over twenty years."

"Indeed", I said, "and what work did you do here? Were you a specialist?"

"No, I was just a 'doctor', all work was the same to us. But do tell me how patients fare that come to you nowadays with all your increased knowledge and technique. It would interest me intensely. Could you tell me in some detail how you handle your practice and your patients?"

I replied: "Most of my patients are sent to me (often, I fear, against their will) for investigation."

"And then?"

"I make a complete and thorough investigation of their pathology and with the aid of X-ray and chemical and blood tests I usually find that the case falls into one of the fairly well-known syndromes."

"And what do you say to the patient?"

"I warn him of the dangerous condition that he is in and point out all the restrictions and alterations of his habits that this entails."

"And do you do no more?"

"Of course I check his symptoms from time to time and keep statistics of his progress. With the aid of previous statistics I can give him a fair average expectation of the course of the disease, its complications and how long it will take."

"But the patient (apart from his organs), do you ever treat him?"

"I am afraid I do not understand your old-fashioned language. How can there be a patient 'apart from his organs'?"

"I mean, sir, do you not treat him as a person, find out about his life, when he leaves your consulting room? Has he a family? Is he happy? Is he hard up or worried, is he mentally distressed, and if so do you ever try to cheer him up and straighten out his personal problems?"

"Oh dear no. How can I with so much to do? He would keep me talking all night, and besides, is it 'professional' to encroach on what is obviously the specialty of his lawyer, his clergyman, and his friends?"

"I see; just one more question before I leave, even more old fashioned than the last. Do you ever say to yourself: 'This man is paying me to make him feel better. Am I doing so?'"

"My dear sir, how he feels is a secondary consideration. What matters is his blood count. I surely at this stage must not be expected to be sentimental on the subject of his aches and pains."

"Well, good night. You asked me when I came in if I had been a specialist; I think I must have been. I was a 'humanitarian'."

I woke up, and he was gone.

Yours, etc.,
"M.D."

Collins Street,
Melbourne,
Undated.

Obituary.

ALFRED FRANCIS STOKES.

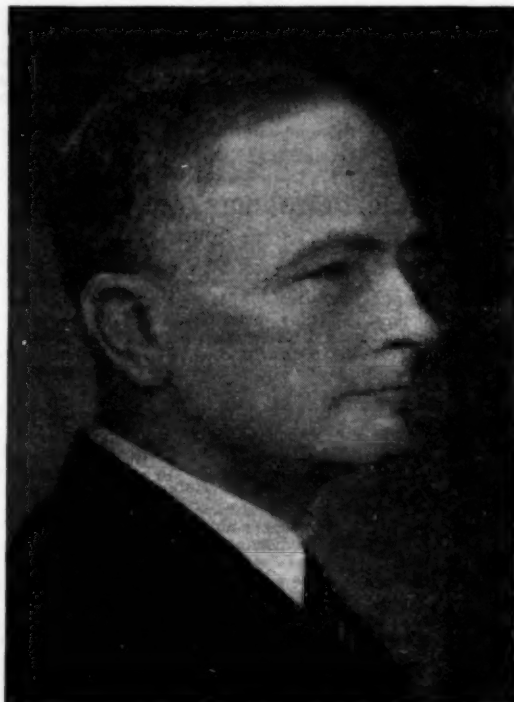
We are indebted to Sir Henry Newland for the following appreciation of the late Dr. Alfred Francis Stokes.

The death occurred on July 1 at Glenelg, South Australia, after a few hours' illness of Dr. Alfred Francis Stokes, one of the South Australian representatives on the Federal Council. On the day following he would have celebrated his

sixty-third birthday. He attended Saint Peter's College, and studied medicine at the University of Adelaide and the Adelaide Hospital, graduating M.B., B.S. in 1904. After a year at the hospital as resident medical officer, he acted as *locum tenens* in several practices prior to spending two years in London and Vienna in post-graduate study. On his return he commenced practice at Gawler, but after three years moved to Glenelg where he was in practice for thirty years.

He went to the Great War in 1914 as captain in the Sixth Australian Field Ambulance. After two years' service he was invalided to Australia.

He was elected a member of the South Australian Branch of the British Medical Association in 1905, and a member of the Council in 1932. He became Vice-President in 1935, and in the following year was elected President. His valuable service during those crowded years led to his election as delegate to the Federal Council in 1937, and he continued to act until the time of his death.



He was a member of the Saint John Ambulance Brigade, and represented the British Medical Association on the Council of Saint John Ambulance Association and on the Council of the Australian Flying Doctor Service.

Although he looked robust, Stokes for several years after the Great War and for some years prior to his death, did not enjoy good health. He accepted these thrusts of unkind fate with a quiet geniality which elicited the admiration of his friends. It was the writer's privilege to restore his health after an operation for a perforated duodenal ulcer in 1928. This led to a friendship that became closer still when we became colleagues on the Federal Council. As President of that body I was in a position to assess the great value of Stokes's work and to observe the regard and respect in which he was held by the other members of the Council. He was a clear and logical thinker. These qualities he made very evident at the last meeting of the Federal Council, when he was chairman of a sub-committee which was appointed to coordinate a series of recommendations dealing with the future of national health and private practice in Australia. Always courteous in debate, his politeness to others never led to deviation from a course he believed to be right.

During the last few years of his life he suffered from cardiac pain on effort, and was forced to give up golf to which he was devoted. He lived in the knowledge that he was on the brink of eternity.

He might well have ceased from giving service to the British Medical Association and the people of the Commonwealth. He served them bravely to the end. He is survived by his wife and two sons, the elder of whom, like his father before him, is a captain in the Australian Army Medical Corps; the second son is also serving with the Australian Imperial Force. To Mrs. Stokes and her sons the Federal Council and the British Medical Association in Australia offer their sincere sympathy.

REGINALD LAIDLAW DAVIES.

We are indebted to Dr. F. P. Sandes for the following appreciation of the late Dr. Reginald Laidlaw Davies.

Reg. Davies, "Uncle Reg." to the young doctors and nurses at Royal Prince Alfred Hospital, was a gentleman and a kindly soul. His portrait by Julian Smith, the elder, hangs in the surgeons' room. Taken on the spur of the moment after a Melbourne medical dinner by one of the world's artists in photography, it shows the characteristic wisp of hair on the forehead, the kindly eye, the sensitive mouth and well-moulded jaw, but under that benevolent gaze there was a strong and determined character who, in spite of many ups and downs in his fortunes, attained a notable success in his profession.

Early in the "naughty 90's", after the bank smash, Reg. came to the university to study medicine, so that he might "have something to fall back upon", as he said. Born to the land, of a well-known pastoral family in the Scone district, subsequent events showed the wisdom of his decision, for the land was ever uncertain.

Entering Saint Andrew's College, Reg. became "one of the boys". Debonair and well-tempered, a good dancer, an accomplished pupil of Stefani, the best teacher of singing in those days, and of Larry Foley, a leading exponent of the fistic art, he played a good stick at tennis and enjoyed life thoroughly. He had also a natural flair for carpentry and was a lover of period furniture. But he did not neglect the serious business of life, and in due course graduated and became a resident medical officer at the Children's Hospital, then a row of four houses in Glebe Point Road. He was associated with such men as Clubbe and Jenkins, Chisholm and Gill, and became a great favourite with the wee mortals under his care. He travelled overseas and later secured the F.R.C.S., Edinburgh. When he returned to Sydney, it was thought that he would practise in a fashionable quarter, but no, he married a girl well known in society and put up a "shingle" in L'Avenue, Newtown—"L'Avenoo" to the locals. Even at that time he was well known as a teacher of parts, for he used to give evening lectures in obstetrics and gynaecology to senior students of an inquiring turn of mind. Later, he purchased a very large lodge practice in the same district, took in a partner, and slaved hard in general practice. Competition was keen and speed was necessary to get there first. He bought the primitive motor cycles and cars of his day, for the hansom cab was much too slow. He persuaded two senior nurses of the hospital to start a private hospital in the Glebe district. Being interested with him in this venture, we gained a good deal of experience in pneumonia and typhoid cases, the latter being very prevalent forty years ago. Perforated typhoid ulcer we knew, but the duodenal was unknown, as was the barium meal. We removed appendices and did odd Caesarean, ovarian cyst and hydatid operations. We followed the fashion of our betters, stitched up the fallen kidney and did gastro-enterostomy for indigestion. We dealt with a couple of Meckel's diverticula and even with an intussusception in an eighteen-hours old baby.

Although there was some lifting of the eyebrows in Macquarie Street, we had enough sense to wear gloves and not to attempt more than we could accomplish. With the powerful aid of the *vis medicatrix naturae* we gained a good deal of medical and surgical experience without any more harm to our patients than occurs in the same type of general practice today. In due course the migration to Macquarie Street happened, and Reg. started to work his way up the ladder of specialism in obstetrics and gynaecology.

Then came the war of 1914-1918, in which he so distinguished himself that he gained the British O.B.E. in the Military Division and the French Legion of Honour. He told many amusing stories of his adventures and we gathered that he was no lover of General, now Marshal, Pétain. The General and his staff arrived unannounced at Reg.'s orthopaedic hospital one morning at 7 a.m. to inspect. It had been a "wet" night and all were fast asleep. The hastily dressed, unshaven and heavy-eyed officers of the hospital were

paraded, and to Reg., the commanding officer, and them all the General spake winged words about "*la patrie*" and the neglect of "my dear wounded", interlarded with a varied selection of French opprobrium and threats of condign punishment. No, Reg. did not like the General. Subsequently all was forgiven, for one night at his home Reg. showed modestly to a few of his friends the chevalier's insignia of the Legion of Honour, so we drank his health and offered our congratulations. Strange to say, within a week he received another. France had been over-generous, but he returned the superfluous decoration.

When the war was over Reg. returned to Macquarie Street and rebuilt his practice. In 1920 he became assistant gynaecological surgeon at Prince Alfred Hospital and was later successful in securing the lectureship in gynaecology and senior surgeon's status which gave full scope to his teaching and operative ability. His lectures were popular, not only for the matter therein, but because of his whimsical ways of imparting clinical wisdom and his knowledge of the human side of medicine, gained from general practice and a life-long study of the gentler sex.

In 1934 he attained consultant rank, and, relieved of the burden of public hospital work, continued his specialism. But in his later years an evil genius pursued him. He suffered from polycythemia with frequent epistaxes, and had many painful experiences in search of relief. He met with a serious motor accident, but drove on many miles to see his case and to keep faith with the country doctor, who found that he had five broken ribs. Septic pneumonia supervened, and when at length he recovered he took a position as medical officer to the Allied Works Council, a post accompanied by much anxiety and much strenuous work for his country. Though his health was failing, unkind fate struck him again with an inguinal strangulation, and yet he made a good recovery and was cheerful withal, announcing that next winter he was thinking of getting rid of his gall-bladder. But alas! that was not to be. His end came suddenly, as the result of an acute gastro-intestinal intoxication and a lapse into coma. The full church at Saint Mark's, Darling Point, was a great tribute to the work of Reg.'s varied and useful life and a fitting farewell to a man who had borne patiently so many afflictions.

DR. H. H. SCHLINK writes:

By the death of Reginald Laidlaw Davies, the Royal Prince Alfred Hospital has lost a valued and loyal member of its honorary medical staff. Even in his student days at Saint Andrew's College and the Sydney University he had formed a large circle of friends by his charming personality and the gift of a fine baritone voice, which was always much appreciated at many convivial gatherings of his fellow students.

After graduation he spent the usual time of residence at the Children's Hospital, as it was then called, and then went to Europe, where he did a post-graduate course in surgery and the F.R.C.S. of Edinburgh. On his return to Australia he commenced a practice in Newtown, and quite early he showed his interest in teaching and conducting extra-mural lectures at his home in The Avenue, Newtown. He attracted quite a number of fifth year students whom he tutored in obstetrics, in which he had a large practice in the district. Later he became a member of the honorary medical staff of the Crown Street and Saint Vincent's Hospitals, where in obstetrics and gynaecology he set a very high standard. Shortly after he had migrated from Newtown to Macquarie Street, the World War I broke out and he immediately volunteered for service abroad. He was considered unfit by the local authorities, but, undeterred by this setback, he approached the French Consul-General of the day in Sydney with the gift of an ambulance to the French Government, which was forthwith accepted, as were his services as an officer in the French Army.

To his military work he brought a good knowledge of general surgery as well as a specialized knowledge of orthopaedics, and he was placed in charge of an orthopaedic hospital in France. For his outstanding work for the French he was awarded the Legion of Honour, and later was transferred to the Australian Imperial Force. On his return to Australia he was appointed to the honorary gynaecological staff of the Royal Prince Alfred Hospital, and became later the lecturer in diseases of women at the University of Sydney. After his retirement from the lectureship he continued to work at the hospital as an honorary consultant, and such was his energy and enthusiasm for his profession that he joined the active staff of the Prince Henry Hospital as a gynaecologist, and to this he was attached until his death.

The writer was intimately associated with him as a senior colleague throughout the whole of his Prince Alfred Hospital

career, and a better, more amicable and more staunch colleague would be hard to find. His technique and judgement were sound. He was generous of outlook, and with his modesty and conviviality he became endeared to all his co-workers. He was in every sense of the word a good doctor. His close friends who knew that he was tormented by one illness after another in his later years marvelled and admired the serene and courageous exterior that he always exhibited to the outside world.

"Reg.", as he was known affectionately to all his intimate co-workers, was a man who will be mourned and regretfully remembered by all members of the staff of the Royal Prince Alfred Hospital.

PERCY GLOVER COOLEY.

We regret to announce the death of Dr. Percy Glover Cooley, which occurred on August 2, 1943, at Double Bay, New South Wales.

GEORGE DIBBS KING WALDRON.

We regret to announce the death of Dr. George Dibbs King Waldron, which occurred on March 11, 1943, at Takoradi, Gold Coast, West Africa.

HENRY CAIRNS LLOYD.

We regret to announce the death of Dr. Henry Cairns Lloyd, which occurred on August 1, 1943, at Melbourne, Victoria.

CHARLES BADHAM.

We regret to announce the death of Dr. Charles Badham, which occurred on August 6, 1943, at Sydney.

Medical Practice.

THE AUSTRALIAN WAR PHARMACOPŒIA.

The following letter is published at the request of the Medical Secretary of the New South Wales Branch of the British Medical Association.

[COPY.]

Dear Sir:

With the introduction of the "Australian War Pharmacopœia" and the subsequent promulgation of a regulation giving this pharmacopœia precedence over all other pharmacopœias in Australia, there is likely to be a variation in the dispensing of different types of prescriptions from time to time until such time as the change-over is completed.

These variations may involve differences in colour and taste, for example, if *Mist Senega et Ammon* is now ordered the "A.W.P." preparation which contains no senega is required to be dispensed. It is therefore desired that members of the medical profession should be made aware of the likelihood of variations taking place, and if at all possible it is suggested that a note to this effect might be inserted in THE MEDICAL JOURNAL OF AUSTRALIA. My Council would greatly appreciate any steps you might think desirable to take to bring this matter to the notice of the profession.

Yours faithfully,

(Sgd.) R. E. GOSTELOW, Secretary,
The Pharmaceutical Society of
New South Wales.

"Science House",
Gloucester and Essex Streets,
Sydney.

July 23, 1943.

Nominations and Elections.

The undermentioned have applied for election as a member of the Tasmanian Branch of the British Medical Association:
Spinks, Betty Brenda, M.B., B.S., 1943 (Univ. Melbourne),
Royal Hobart Hospital, Hobart.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Knox, John Wallace, M.B., B.S., 1943 (Univ. Sydney),
Royal Prince Alfred Hospital, Camperdown.
Milgate, Leslie Thomas, M.B., B.S., 1943 (Univ. Sydney),
Sydney Hospital, Sydney.

Diary for the Month.

- AUG. 17.—New South Wales Branch, B.M.A.: Ethics Committee.
- AUG. 18.—Western Australian Branch, B.M.A.: Branch.
- AUG. 19.—New South Wales Branch, B.M.A.: Clinical Meeting.
- AUG. 23.—Federal Council of the B.M.A. in Australia: Meeting at Melbourne.
- AUG. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- AUG. 25.—Victorian Branch, B.M.A.: Council.
- AUG. 26.—New South Wales Branch, B.M.A.: Branch.
- AUG. 27.—Queensland Branch, B.M.A.: Council.
- SEPT. 1.—Victorian Branch, B.M.A.: Branch.
- SEPT. 1.—Western Australian Branch, B.M.A.: Council.
- SEPT. 2.—New South Wales Branch, B.M.A.: Special Groups Committee.
- SEPT. 2.—South Australian Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmains United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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